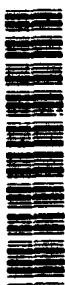


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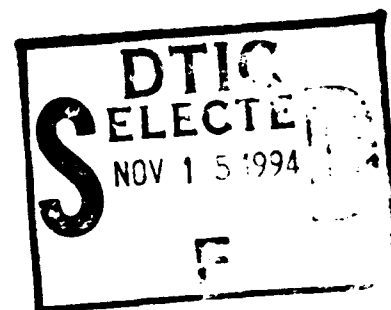


Technical Report 996

Principles of Design for High Performing Organizations: An Assessment of the State of the Field of Organizational Design Research

Richard N. Osborn and C. Christopher Baughn
School of Business Administration
Wayne State University

March 1994



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**A Field Operating Agency Under the Jurisdiction
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EDGAR M. JOHNSON
Director

Research accomplished under contract for
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**Principles of Design for High Performing
Organizations: An Assessment of the State
of the Field of Organizational Design Research**

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March 1994

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FOREWORD

As has occurred several times in past history following the collapse of an external threat, the U.S. Army is now in the process of trimming size and costs to meet national mandates. However, the challenge is different now from that previously experienced. Unlike at any time in the past, the United States is the preeminent world power. In the view of many, this preeminence implies a broad range of global responsibilities that probably exceed those assumed following World War II in complexity, but which must be met from a much less munificent resource base. The present era presents an unparalleled challenge to reduce size and costs while becoming capable of executing a broader range of missions.

To the extent that more diverse missions may require a greater diversity of military organizational forms and leader decision skills, the current time frame must provide the planning foundation for developing the new designs and leader development experiences. This report is the first of a series designed to lay out both for military planners and for future research the current state of the art on organization theory and design. It deals broadly with research in academia and the private sector. The second in the series will identify unknowns and "cutting edge" research that might be done to reduce them. The third will identify, collate, and summarize the historical files on military divisional structure test and development. These reports should provide a useful starting point and logic for work on new organizational forms anticipated in the 1995-96 time frame.

EDGAR M. JOHNSON
Director

PRINCIPLES OF DESIGN FOR HIGH PERFORMING ORGANIZATIONS: AN ASSESSMENT OF THE STATE OF THE FIELD OF ORGANIZATIONAL DESIGN RESEARCH

EXECUTIVE SUMMARY

Requirement:

With the abrupt disintegration of the Soviet threat, pressures immediately began building for a reduction in military spending. To a major extent, reduction in military spending is synonymous with reduction in size of standing force. However, the world has not become substantially less hostile. The challenge of the 90's is thus to design an objective Army capable of dealing with the much more diverse threats of the next century. To the extent future designs of military organizations might profit from the extensive organizational design research done in the private sector, the U.S. Army Research Institute for the Behavioral and Social Sciences initiated an effort to survey that extensive literature, derive principles that might be applied as solutions for envisioned military design problems, and identify research that needs to be done to answer questions at the leading edge of the ongoing work.

Procedure:

The organizational design literature dating from 1985 was surveyed to identify "leading edge" issues and findings. In addition, a sample of established and "emerging scholars" was identified; the "emerging scholars" were selected as those likely to be at the "cutting edge" using the criteria of (a) relative youth, (b) high current publication rate, and (3) nomination as a potential future leader in the field of organizational research. A total of 48 of these current and future leaders responded with identification of 99 research themes and issues. A subset of these selected junior scholars and leaders produced example research designs to address cutting edge issues.

Findings:

The Literature. The field of organization design is characterized, as many are, by multiple theoretical positions. Each of the preponderant theories has merit by its focus on a particular set of issues or problems and, its critics would assert, is unable to focus adequately on at least some other set of issues or problems.

By far the most popular view is that organization design is based on organizational purpose. It specifies vertical specialization (with control measures) and horizontal specialization (with coordination means). At the extreme, organizations can be organic (emphasizing coordination), or mechanistic (emphasizing control). Some theoreticians also emphasize organizational roles, e.g., Mintzberg, who differentiated five different organizational components (operating core, middle line, strategic apex, technostructure, and supporting staff).

There are also "emergent" aspects of organizational design. Structure dimensions reflect the enhancement needs of members that may be expressed in a variety of ways. Theoretical views reflect (a) power/dependence power and control dynamics of organizations, (b) issues of how members cope and reach toward goals, and (c) institutionalization processes that seek to increase the legitimacy of the organization in the eyes of key constituents.

As might be implied by the diversity of views on design and structure, pure forms may be less prevalent than mixed forms. Large-scale organizations may evolve into ostensibly incompatible mixtures of types and forms, e.g., some functional elements organized mechanistically and others organically, in each case the form providing suitable control/coordination/boundary spanning emphasis as required to serve the function.

Three important midrange theories underlie much of the work on organizational analysis.

- **Systems Approaches.** These approaches emphasize the rational, goal-directed aspects of organizational existence. The essential logic is that of input-throughput-output purposefulness, and the general criterion of interest is effectiveness of the organization. Systems theories generally lack consideration of emergent aspects (the human dimension).
- **Ecological Approaches.** Ecological theories focus on evolutionary processes that influence growth and decline of populations of type organizations. Key concerns include the social conditions that favor the growth or demise of a given organizational type or form.
- **Strategic Choice Approaches.** Systems and ecological approaches view organizations essentially as though no leadership existed at the top guiding them in strategically formulated directions. While this may or may not be the view from the outside, most senior managements profess to have strategic directions for their organizations that will enhance the survival of the organization and facilitate its long term future. In this view, organization structure flows at least in part from strategy, and strategy is in turn influenced by transaction cost economics, i.e., the cost of doing business in one form or another.

Major Themes. Three themes were particularly prevalent in the issues nominated by the emerging scholars. (See ARI Research Note 94-16 for a complete presentation.) They were (1) organizational networks, (2) organizational adaptability and transformation, and (3) structures and processes facilitating organizational innovation. Each of these themes was

reflected by 13 to 15 suggestions--over 40% of the responses fell into one of these three content areas.

- **Organizational Networks.** Examples of networks include joint ventures and partnerships, research consortia, "quasi-firms," inside contracting and subcontracting systems, and organizational links to customers and suppliers, including keiretsu-type relationships. The researchers addressing this area maintained that research identifying fundamental building blocks of such networks could not only serve to develop an understanding of these emerging forms, but may also prove useful in designing novel organizations. Emerging organizational designs that reflect changes in technology and strategies often include flatter structures, computerization, decentralized decision making, centralized monitoring, and geographic separation. While such designs suggest network structures, we lack understanding regarding network development, design, and governance.

- **Organizational Adaptability and Transformation.** This theme underscores the need to increase understanding of how to develop flexible structures that can restructure rapidly as conditions change. Organizations face continuing rapid changes in markets, technology, and competitors, and therefore need to develop the ability to sense the need for change rapidly, to make strategic choices, and to implement change. There is an associated need to improve models of organizational transition and to support such efforts with longitudinal, multifirm research. Alternative approaches to being simultaneously flexible/adaptable and efficient also need to be delineated, and the circumstances under which these alternatives are appropriate and effective must be addressed.

- **Organizational Innovation.** This domain includes technology development process. As firms are pushed to shorten product development cycles, more needs to be known about the importance of special roles, structural arrangements, and communication processes. This involves organizational adaptation to perpetual innovation and technological change. There is also a need for research to address integration across functions in product/process development and product/process engineering in rapidly evolving environments. Organizational efficiency and effectiveness in the development of computer hardware and software and toward computer integrated manufacturing systems was also posited to be a fruitful line of inquiry.

Related Themes. In addition to the major themes above, a number of less general but related themes also emerged.

- **Communication Technology.** Organizational designs and forms have always been constrained by the available communication technology. Significant advances in information technology may lead eventually to new organizational design options. The increasing availability of media allowing coworker interaction in real time (FAX, picture phone, etc.) reduce time and space constraints on the organization. The impact of the computer on organizations may require reevaluation of the extent to which extant coordination mechanisms are needed.

- **Information Systems.** Computers, by changing the nature of organizational information systems, may also have the potential to affect organizational structures. The issue is how different types of organizations receive, encode, and store information. There is a need to know more about how organizations gather, attend to, and process information, how structures and routines constrain what is perceived, and how they are modified over time. Future research could show how different types of organizations must have different learning mechanisms.

- **Organizational Learning.** Issues of organizational learning and strategy have utilized the construct of "core competence." There is a need to operationalize and evaluate conditions surrounding the development and application of core competencies. On a more macro scale, input is needed on reskilling the U.S. work force.

Integration. Organizations now face many challenges. Four of the most daunting are management of retrenchment, learning (from experience and incorporating learning outcomes in time to enhance survival), innovation (incorporating both technological and managerial change at an increasing pace), and the formation of alliances and networks to facilitate operations in response to increasing globalization. Issues around retrenchment are particularly relevant to challenges now facing the military establishment. The literature shows that retrenchment is not always effective when considered alone as a solution to resources problems. To downsize effectively, organizations must also create new structures that will simultaneously enhance innovation and organizational learning. Broadly, as the pace of change forced by environmental variation increases, there may well be some advantage to structure that encourage an open, dynamic problem-solving orientation, along with enhanced information transfer and feedback of performance assessment. A complex integrated model of organizations is offered as a more parsimonious approach to these diverse challenges and as an important tool for guiding future research.

Utilization of Findings:

This report is the first of three that will constitute the foundation for planning future organization design research as the Army seeks to use the current downsizing mandate as an opportunity to develop new and creative approaches to the development of organizational designs and forms that will provide for increased adaptability and flexibility.

PRINCIPLES OF DESIGN FOR HIGH PERFORMING ORGANIZATIONS: AN ASSESSMENT OF THE STATE OF THE FIELD OF ORGANIZATIONAL DESIGN RESEARCH

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PRINCIPLES OF DESIGN FOR HIGH PERFORMING ORGANIZATIONS: AN ASSESSMENT OF THE STATE OF THE FIELD OF ORGANIZATIONAL DESIGN RESEARCH

CHAPTER I

ASSESSING THE FIELD OF ORGANIZATION DESIGN

INTRODUCTION

It is abundantly obvious that the U.S. Army faces a series of fundamental reorientations in the 1990s. There appear to be substantial changes in the threats facing the U.S. For instance, with the demise of a direct, immediate threat to NATO nations in Europe, the Army will need to be prepared for more diverse combat roles. Instead of preparing for high intensity combat against an identifiable, concentrated enemy with a superior number of troops and sophisticated weapons, the Army may need to prepare for a more diverse series of threats. Yet, in addition to reductions in European forces, budget necessities may also yield substantial reductions in force.

There is the potential for both evolutionary and revolutionary change in the way the Army "does business" since the roles and missions of the Department of Defense, and the society within which the Armed Forces are embedded, are changing so dramatically. These forces for change make essential a technology for organizational design or redesign to enhance effectiveness, readiness and reliability--especially in small scale deployments involving distributed leadership and decision making.

Thus, the purpose of the project underlying this report is to assess the current state of the art of purposeful organizational design, articulate key issues in this developing field and translate these issues into a program of theoretically and operationally relevant research.

PURPOSE OF THE REPORT

The purpose of this report is to review the organizational design literature systematically to assess the current state of the art. Four approaches were used: (1) a computerized literature search of relevant material from 1985 to the present, (2) a survey of experienced researchers, (3) solicitation of example research proposals from emerging scholars and (4) an updating of prior reviews, guided by selected research issues in the underlying statement of work.

ORGANIZATION OF THE REPORT

This report is organized into eight chapters. Chapter I introduces the material and provides a road map for reading the report. Chapter II presents important terminological information as a background for the reader. Chapter III discusses a number of key research issues identified in the statement of work, and Chapter IV reviews the most prominent theories of organizational design.

Chapter V discusses four key change issues facing organizations in the 1990s. These are challenges to retrench, learn, innovate, and develop appropriate strategic alliances and

networks. Chapter VI integrates the major conceptual approaches to organizational design and links this integration with the four key change issues. It uses the integrated model to characterize research in the emerging change areas. Chapters VII and VIII provide valuable background information. Chapter VII lists the references used in the report and VIII provides an annotated bibliography from a computerized literature research.

OVERVIEW AND HIGHLIGHTS OF THE REPORT

Chapter II provides a systematic review of the foundations of the organizational design literature as a background for the remaining chapters. It discusses organizational design as an instrument of purpose, the role of design in strategic implementation and important emergent views of organizational design from the experience of participants. It also discusses radical versus evolutionary views of design and notes the difficulty of studying managerial processes.

Readers familiar with the organizational design literature may want to skip this basic chapter as it reviews most of the basic literature in the field. It does provide a series of definitions for key terms and documents the different logics and approaches underlying different views of organizational design.

Assessing a Proposed Organizational Structure

Chapter III discusses a number of potential research issues mentioned in the statement of work supporting this research. It addresses (1) the rapidity of design, (2) analytical and qualitative approaches, (3) assessment of proposed designs, (4) graphic versus analytical methods and (5) lessons from the civilian sector.

A main feature of this chapter is the series of guidelines for assessing a proposed organizational structure. By combining literatures it is possible to isolate some general criteria for judging whether a proposed organizational structure is ready for implementation. Three general criteria revolve around (1) technical adequacy, (2) systems characteristics and (3) the ability of the design to meet strategic initiatives.

Technical criteria concern the degree to which the proposed organizational structure facilitates the accomplishment of specific tasks. Three key technical questions need to be answered affirmatively. One, is the design complete (all activities, functions and individuals incorporated)? Two, can designers adequately defend key design decisions? (A listing of adequate defenses is provided.) Three, is the design understandable by those who will implement it and will it yield the intended consequences (called achievability)?

Systems criteria deal with whole parts of the organization and attempt to assess the extent to which the organizational design promotes consistency, integration, responsiveness, and learning. Strategic criteria deal with the organizational design as an instrument for implementing the strategy of the firm. In much of the current literature, strategy may be linked to (1) a vision of the future, (2) a specific goal, (3) identifiable capabilities, (4)

implementation of a specific plan and/or (5) continuation of a specific pattern of emergent action. Each of the views provides criteria for the assessment of a proposed organization design.

Toward An Integrated Theory of Organizations

Chapters IV, V and VI provide three complementary conceptual views of organizations and organization design. Organizations can be extremely complex and they need to be examined through a variety of conceptual lenses. Chapter IV discusses three important, competing, mid-range theories of organizations: (1) systems approaches with their emphasis on survival and goal attainment (both open systems and stratified systems theory are discussed), (2) ecological and institutional approaches with their emphasis on environmental determinism and (3) strategic choice views with their emphasis on the actions of senior management. Each is analyzed in detail.

Chapter V takes another view of the literature in terms of some key change issues facing organizations in the 1990s. The four key issues discussed are (1) retrenchment, (2) organizational learning, (3) innovation and (4) strategic alliances and networks. As documented in this chapter, each of these issues has generated research that cuts across the mid-range theories and different units of analysis (individuals, groups, units and organizations). Each body of literature provides prescriptions for organizational design. Research on these important issues exemplifies the growing complexity facing modern organizations.

Above all, the review suggested a strong need for a conceptual integration of the current literature. Chapter VI integrates the mid-range theories for a static view of organizations and provides guidelines for researching dynamic aspects of organizational design. It provides an analytical, graphic and metaphorical view of the proposed integrated model.

The model discusses the role of three important causal mechanisms underlying many current views. Specifically, the role of rationality from the systems, population ecology, and industrial economics explanations is discussed in detail. This is followed by an analysis of power and control as a causal mechanism. The treatment draws on literature discussing the strategic choice and power/dependence views of organizational design. Finally, the important role of member enhancement is discussed. Based on literature discussing negotiated creation of organizational reality (or how managers and workers construct a realistic operating view of their part of the organization to get things done) the role of emergent processes is discussed. These emergent processes include learning, innovating, organizational culture, and leadership. The importance of member social interpretation and correspondence with external cultural requirements (or institutional requirements) is stressed over individual needs, wants or desires.

The highlight of this chapter is a discussion of research needs based on (1) the proposed integrated model, (2) the four change issues and (3) the major causal mechanisms

identified in the proposed integrated model. Current work concerning each of the four change issues is assessed, and missing areas for research are identified. This discussion forms the basis for the Task II report concerning a viable research agenda for organizational design.

Valuable Reference Information & Sample Proposals

Chapter VII gives the reader a comprehensive bibliography. Part A presents the literature cited in the report while part B lists the annotated references identified through the computerized search so that the reader can derive his/her own picture from the recently published literature.

The two appendixes are taken directly from the surveys of organizational researchers and were published as ARI Research Note 94-16. Appendix A discusses the responses from experienced researchers to an inquiry from the principal investigator concerning the two most important research issues for organizational design in the 1990s. Their responses are discussed. Appendix B provides examples of proposals for research from emerging scholars in the field. Over a dozen proposals from newly promoted assistant professors are provided. These proposals are a testament to the variety of research programs now being conducted within the organizational sciences.

SUMMARY AND POTENTIAL USES OF THIS REPORT

In sum, the report should be a valuable reference document for those interested in studying organizational design. Rather than attempting to sell a particular view of organizations or organizational design, this document should provide the reader with sufficient information to decide independently on research themes deserving further attention. It reviews up-to-date approaches, discusses key issues in design research, provides a proposed integrative view, presents a comprehensive listing of recent work, and catalogs over a dozen sample research proposals.

CHAPTER II

THE MULTIPLICITY OF VIEWS CONCERNING ORGANIZATIONAL DESIGN

In the current literature there is a wide variety of views concerning what constitutes the organizational design of the firm. This chapter will review a number of these to provide a terminological basis for subsequent reviews. Specifically we will examine design dimensions derived from the purpose of the organization, designs for strategic implementation, and the design as an emergent process.

The chapter is organized into five major sections. Section one discusses designs derived from the purpose of the organization. Section two presents design aspects based on emergent dynamics within organizations, and section three discusses evolutionary versus radical change. Section four briefly reviews problems with studying management processes, and section five provides a summary of the chapter.

DESIGNS DERIVED FROM THE PURPOSE OF THE ORGANIZATION

In these views, the structure of the organization is the primary mechanism used to reach organizational goals. Essentially the designer either breaks down the purpose into more specialized activities or attempts to analyze how workers and managers are currently performing their tasks to reach pre-set targets. The designer may also move from some global mission to a more detailed statement of strategy to derive the goals of the organization.

Dimensions of Planned Design: The View From the Top

In the simplest view, the structure of the organization is likened to the anatomy of mammals. Typically the structure includes the intended (normally by senior management) patterns of (1) vertical specialization (division of labor up and down the organization, often by authority ranks), (2) horizontal specialization (division of labor across various units, departments and individuals in the flow of work), plus the mechanisms intended to (3) control and coordinate the efforts of various individuals, units, and departments.

As organizations become large, one of the first overall divisions of labor to become evident is the separation of line (command) and staff (those that assist the line), and the clear demarcation of implementers, middle management, and senior management. Thus, top management has a wide variety of choices concerning the patterns of vertical specialization (e.g., number of ranks and use of assistants to positions) and control (e.g., monitoring of inputs, processes and/or outcomes). And there is an almost equal number of variations concerning horizontal specialization (division of work into functions, territories, clients, products or collections of territories, clients and/or products to yield divisions) and coordination (both formal mechanisms such as information systems and informal mechanisms such as task forces and the grape vine).

Since there are so many variations, a number of scholars have developed ideal types of firms based on their structural configurations. An ideal type provides for a consistent pattern of vertical and horizontal specialization matched with the theoretically appropriate types of controls and coordination. These idea patterns are expected to yield a very specific emphasis on a particular type of performance. Two of the best known are by Burns and Stalker (1961) and Mintzberg (1979).

Organic and Mechanistic Types. Burns and Stalker's (1961) classic study of British and Scottish industrial organizations differentiated between mechanistic and organic organization systems. Mechanistic firms emphasize vertical specialization and control while organic firms emphasize horizontal specialization and coordination. Mechanistic systems emphasize hierarchical control, communication and authority. They tend to place high emphasis on subdivision of tasks and formal, precisely defined responsibilities for each functional position. Organic systems, on the other hand, involve less specialization, more loosely defined responsibilities and obligations, and high levels of lateral patterns of interaction. Based on Burns and Stalker's work, organic firms were expected to excel in innovation and response to subtle external changes while the mechanistic firms were prized for their efficiency and response to an external crisis.

While Burns and Stalker recognized that larger organizations were more structurally complex (more vertical and horizontal specialization, more controls and more coordination), their emphasis was on the use of relatively more or less rigid bureaucratic methods. Their work and several subsequent tests of the overall approach have had a major impact. However, their ideal types are limited to larger bureaucracies and do not attempt to cover all facets of organizational design.

Mintzberg's Typology. Mintzberg (1979) divides the organization into five components. Vertically, there is the operating core, the middle line and the strategic apex (line work units, middle management and senior management). Attached to the middle of the organization are the technostructure and the support staff. In more traditional views of organizations these would merely be called staff. However, individuals and units in the technostructure are those who standardize operations for all others. This standardization may be for work processes (e.g., industrial engineering), control (e.g., budget analysts and accountants) and individuals (e.g., trainers and recruiters). The support staff refers to units that indirectly support the operations of the firm. Typical examples include the cafeteria, buildings and grounds, and the mail room. Given these five units, different configurations can be developed to represent different ideal types.

The five different organizational configurations or ideal types discussed by Mintzberg (1979) consist of "simple structure," "machine bureaucracy," "professional bureaucracy," "divisional form," and "adhocracy". In the so-called "simple structure," the strategic apex is the key part of the organization. It uses comparatively simple patterns of vertical and horizontal specialization to extend centralized command and relies heavily upon direct supervision to control and coordinate operations. The next pure type is very similar to the

Burns and Stalker (1961) model of the mechanistic organization. Called the machine bureaucracy, this is a much more sophisticated pattern of vertical and horizontal specialization where the technostructure is the key organizational part. Standardization and formalization via rules, policies and procedures are used for control and coordination of activities. The U.S. Army during the First World War, U.S. Steel until the 1960s, and Ford Motor until the 1980s are classic examples of machine bureaucracies.

In contrast to the machine bureaucracy, Mintzberg argues that many large research and development organizations and universities follow a pattern called the "professional bureaucracy." Here, the operating core is the most important unit and the pattern of horizontal specialization typically follows from similarities in skill or expertise. Thus, universities often have departments for various research specialties. Control and coordination may be comparatively loose but a closer examination suggests some standardization by skills rather than policies or procedures.

The last two forms may be seen as combinations of the others. In the so called "divisional form," we find collections of simple structures, machine bureaucracies, and professional bureaucrats under one administrative umbrella. The U.S. Army of today is a good example of such a complex divisional form. The strategic apex holds together this collection of businesses to form one firm. The chief mechanism for control and coordination involves standardization of outcomes such as contribution to overall profit. The key part of the organization is the middle line or heads of the different businesses composing the firm. The final pure form is the "adhocracy". Here, staff in combination with individuals from the work units are the key to survival and profitability. Mutual adaptation for problem solving is the key mechanism for control and coordination, and the structure is very flexible and decentralized. A research and development lab is considered a good example of an adhocracy.

Each ideal type is expected to have different strengths and weakness and is expected to emphasize slightly different performance characteristics. For example, the adhocracy stresses the contributions of lower line workers and managers. Its emphasis on innovation is accommodated by the minimization of hierarchical authority, the division of labor by expertise, the willingness to engage in high risk activities, and the extreme lengths to which individuals in these small units will go to integrate and coordinate their work through mutual adaptation. While the adhocracy is expected to yield high innovation, it is not suited to sustained routine operations. It is limited to small organizations simply because of its individualistic coordination mechanisms.

Each of the five different types is expected to thrive in a different environment. Moreover, there are often severe size limits on the simple structure and the adhocracy while technological factors often appear to dictate whether a large organization will use a machine bureaucracy or a professional bureaucracy.

The View From the Bottom: Centralization, Standardization, and Formalization

From studies dating the 1960s by a group of scholars called the Aston group comes another popular approach to the description of the organization's structure. Here, researchers asked members to describe what they saw in the on-going operations of the organization. Managers and workers emphasized (1) the degree of centralization and decentralization in decision making, (2) the standardization of work procedures and (3) the formalization of their work.

These three dimensions can easily be related to the aforementioned top-down view and many managers now recognize the importance of these dimensions. Centralization/decentralization of decision making taps perhaps the most important element of vertical specialization. Where in the hierarchy are different types of decisions made?

While senior executives may see subtle differences between control (to link vertical units together) and coordination (to link units at or near the same level together), few members make such a subtle distinction. All they see is the degree of bureaucratic constraints on their actions. Thus, standardization of work (essentially a control technique with implications for coordination dealing with known, repeated methods used to perform tasks), and formalization (essentially a bureaucratic method of coordination with control implications dealing with rules, policies and procedures for moving work across and sometimes up/down the organization) are combined views of control and coordination as they are applied to lower level managers and workers.

Since many organizational studies deal with how employees react to different types of structures, one often finds that specialization, centralization/decentralization and standardization/formalization become the key dimensions for describing the structure of the organization. This is particularly the case in older, more bureaucratic organizations (as in Burns and Stalker's mechanistic structures and Mintzberg's machine bureaucracies) where studies of alienation, worker participation and leadership suggested that managers needed to counteract the stiffening effects of over-structuring. Now we are seeing these old organizations attempt to drop much of the middle management (e.g., downsizing) simply because expensive bureaucracies backed by hoards of middle managers insuring compliance does not provide the necessary efficiency, responsiveness, and learning needed in today's business environment.

Design as Strategic Implementation

While organization theorists studied bureaucracies, a whole host of economists and strategists were analyzing how firms made money. From these studies of strategy came an understanding that the structure the firm possessed should be derived from its strategy.

Chandler: Structure follows Strategy. One of the first to make this linkage was Alfred Chandler (1962). In his studies of huge corporations, he noted they altered their organizational designs to match their expansive tendencies. Specifically, they changed the top

level pattern of specialization from a functional pattern (marketing, operations, finance, personnel) to a divisional form (horizontal specialization by client, territory and/or line of business). In Chandler's M-form or divisional arrangement, managers were held accountable for a separate business or a group of businesses (as in the General Motor's divisional structure for different car lines). This structure allows senior managers to develop strategies for the longer run, coordinate the actions of different businesses, and emphasize selection/development of middle level managers.

Generic Strategies and Structure. Subsequent analyses of strategy attempted to identify so-called "generic strategies" or ways firms could make money in different industries, and then link these generic strategies to various structures. For example, Porter (1980) suggested that firms should stress (1) economies of scale, (2) differentiation, or (3) focus. The low cost strategy called for a design that would emphasize efficiency, while differentiation called for innovation and organizational designs that stressed innovation. No clear specification for the focus strategy has been identified.

Miles and Snow (1986) have labeled three generic strategies as "prospectors", "defenders" and "analyzers." Prospector firms, whose competitive strategy entails being "first-to-market" with a new product or service, rely on innovative technologies and products. Such firms are seen as utilizing flexible structures where planning and control are decentralized. Defenders tend to offer a limited, stable product line and compete primarily on the basis of value or cost. They are seen as relying heavily on functional organizational structure, centralized decision making and control, vertical communications and integration, and high degrees of technical specialization. Miles and Snow (1986) maintain that analyzers, who imitate and improve upon the product offerings of competitors, employ a "mixed" structure, such as the matrix. This is intended to blend features of both functional and divisional structures in an attempt to be both efficient and flexible.

Multiple Strategy and Structure Combinations. In more recent years, the notion of a small set of "generic strategies" is losing favor and being replaced by more robust notions of strategy. These are discussed in Chapter II under the selection of strategic criteria for assessing proposed structures and in Chapter IV under strategic choice. Further, it is now recognized that the clear separation of strategic formulation from strategic implementation is too artificial. Recent work, such as by Burgelman (1984) suggests that the organizational design needs to promote apparently contradictory elements within the organization. For instance, implementation of top management directives needs to be coupled with a healthy skepticism and innovative alteration to increase the chances of success.

Two alterations in the view of organizational design have resulted from these strategic analyses. One, the design should match the strategy and yet the strategy may be a part of the overall design of the whole organization. The apparently confusing view stresses the importance of linking strategic formulation and strategic implementation. Two, the firm can be examined structurally as a series of contracts. This second view calls for some explanation.

Organizations as a Bundle of Contracts. Based on work by economists in the 1930s and 1940s, Williamson (1979) revised the notion of "transaction cost." He viewed the organization as a bundle of contracts administered hierarchically. The costs of controlling and coordinating, as well as the risk of being unable to enforce these contracts, are transaction costs. An alternative to hierarchies (organizations) is the market. Essentially, price and contract provisions attempt to yield the necessary control, coordination, and strategic direction provided within the organization.

In this view of the organization, one basic strategic decision is to decide what the organization should keep inside, what it should "contract out," and what it should administer via so-called intermediate mechanisms (often called alliances).

Alliances as a Part of the Organizational Design. One major contribution of a transaction cost perspective is to widen the view of the organization to incorporate a number of quasi-affiliated units, firms, individuals and agencies along a value-added chain running from primary producer to ultimate consumer. For example, an examination of the Ford Motor Company would include its suppliers and distributors. In this light, analyses of Japanese keiretsus show this is an example of a network of organizations. In many strategic respects, such as funding, which businesses to enter, and the like, these firms act in concert with one another.

Another major contribution is reexamination of what activities need to be within the organization. For instance, several firms, such as Nike, contract-out their production to a number of captive suppliers. Based on the analyses of the Japanese, U.S. auto makers are cutting the number of suppliers and working with these suppliers to obtain innovation, cost reductions, and higher quality products. The firm is no longer viewed simply as a unitary hierarchy, but as a holder of specific capabilities that provides specific contributions within a larger network of relationships.

EMERGENT ASPECTS OF ORGANIZATIONAL DESIGN

While there is little question that senior management has a substantial influence over the organization, it does not "determine" the pattern of relationships among members. Instead, members create and maintain their own social, task, and external relationships. Several authors have noted the importance of these "emergent" aspects of organizational design. Most have also noted that the type of planned design interacts with the "emergent" aspects to form a more realistic and complex view of organizational design and action.

Just as the Aston group, in describing organizational design, infused a purposive view to derive their dimensions of centralization/decentralization and formalization/standardization, to a greater or lesser degree, most authors taking an emergent perspective mix what they see with what they believe should be. This is most clearly seen in analysis of "organizational learning." It is somewhat less obvious in social construction and institutional views.

Organizational Learning

Several authors have noted that pure implementation is insufficient for survival in a turbulent environment. They suggest that organizations should have the capacity to learn. While some authors make a direct linkage between individual and organizational learning, more recent work emphasizes the organizational elements necessary to obtain information, transform it, store it and use it to eliminate mistakes, spot opportunities and improve the organization.

Organizational learning is an emergent aspect of organizational design simply because it stems from the experiences of individual members and how they do or do not pass their experience on to others. While it is possible to examine organizational learning as if the organization were not composed of individuals, this may limit the vision of the researcher. Organizational learning can emerge from the collective experiences of organizational members. Thus, the researcher needs to focus on the interface between individuals and organized systems.

Social Construction of Reality and Negotiated Orders

A number of scholars suggest that organizational participants create the organization in their own minds by negotiating constructed meanings through their daily interactions with each other. In this view, the organization is less a unified entity than a loose coalition of interests. Scholars following this tradition study how collections of individuals view their part in the organization and the firm as a whole. They study the relationships among various collections to plot the patterns of action and reaction. Such studies help scholars understand why the organization does not always act as if it were a rational goal seeking system.

Theoretical Assumptions. The term social construction is used to reflect two important underlying assumptions. One, social action can be understood by taking into account the meanings of participants. Two, social meaning arises from social interaction.

The notion of a negotiated order reflects two other facets of life in a complex society. One, individuals bargain over the depiction of reality to their own benefit. Two, the bargaining is, in part, guided, directed and contained by the larger rules of the society.

Variations of these may and often are used to explain various patterns of meaning within complex organizations. An emphasis on the negotiation aspects yields a power/dependence view. Conversely, analysis of constructed meaning yields an analysis of organizational cultures. These will be discussed after the central propositions of the perspective are discussed.

Two of the most important aspects of this view of organizations present a direct challenge to the managerial hierarchy of the organization. First, participants will self-define the organization and their part within it. This description may not be what senior management desires. Second, the constructs, ideas, values and goals brought to the organiza-

tion may be more important to the participants than the organization's goals, values, or understandings.

Social Constructionism and Organizational Design. The design of the organization reflects the broader social organization of the society in which it operates. If it chooses to horizontally differentiate around existing occupational specializations, as with the professional bureaucracy, it implicitly absorbs the values, methods and goals of the various occupational specializations. Members with these specializations compete or negotiate among one another to define their part within the organization.

To senior managers, reliance upon existing specialties presents a very mixed blessing. It allows the organization to use already highly trained individuals for complex tasks. The organization can rely upon professional motivation for high quality as the self concept of professionals may incorporate a desire to contribute to society through the firm. However, each identifiable group may have a different vision of the organization and attempt to move it away from the strategic direction and goals established by senior management. This process of redirection is not an overt challenge to management but a subtle redefinition of standards, methods and ways of doing business. Unfortunately for senior management, the result is often extreme difficulty coordinating the actions of highly professionalized units.

Vertical differentiation within the professional bureaucracy, for instance, may be more problematic. Senior managers want to determine the status, power and command hierarchies within the organization while operating under the myth that expertise increases as one moves up the organization (See Scott and Hart, 1991). For instance, as Jacques and his colleagues (Jacobs and Jacques, 1991) imply, the job of the manager calls for increasing cognitive complexity as one moves up the hierarchy. The "mistake" appears obvious to the professionals. The managers confuse power and prestige with the complexity of the job.

Thus, professionals may promulgate a counter mythology. Academic administrators, for instance, are failed professors who were selected into administration because it was less complex than research and teaching. The hospital administrator may be the bureaucratically most powerful individual within the hospital. However, surgeons may counter this power by labeling the administrator as technically less competent. This is known as the leveling effect. Of course, the outside observer realizes that organizations are complex on many grounds including both technical and administrative dimensions, among others.

A relative stable series of "negotiated orders" may be expected to evolve over time. The organization becomes a collection of loosely linked clusters. Each cluster has its own rules for operation. And the linkage between clusters can be seen as a series of "treaties" among interdependent units. Horizontally, the "treaties" allow each cluster to perform its activities in relative autonomy. These treaties provide other parts of the firm with acceptable products and services.

Vertically, the organization splits into technical, administrative and strategic zones. While strategists may set the overall direction of the firm, this strategic formulation, by itself, is meaningless. The language, analytics and decisions of this group form a separate sphere. While middle management is expected to "implement" the "strategies" of the senior managers, they interpret the strategy to fit their own view of the corporation. Thus, what is decided and what implementation is attempted may or may not appear to be congruent to the external observer.

From this perspective of socially constructed negotiated orders, the organization may be a very stable collection of quasi-autonomous parts. Dramatic, quick attempts to alter the pattern of negotiated understandings, say by top management direction, can be expected to fail. Conversely, the organization may continue to operate successfully for comparatively long time periods, even with ineffective top management. Mutual adjustments to externalities and alterations in the technology among the various groups can keep it viable.

Power/Dependence Variation. One variation stressing the negotiated aspects of organizations and the political realities of senior management is offered by Pfeffer and his colleagues (e.g., Pfeffer and Salancik, 1978). The analytics are comparatively simple but the effects can be subtle and pervasive. Essentially, power is viewed as a relational construct that is derived from the dependence of individuals and their institutions on each other. Senior managers, in searching to acquire the resources needed for the firm, strike as favorable a bargain as possible. They avoid crippling dependencies on others and attempt to disperse the influence of others on the firm.

The negotiated trades are both direct and indirect. To some extent, senior managers select other organizations to work with (suppliers, distributors and regulatory agencies). Such selection may be direct as in selecting a particular supplier or indirect as in moving to a different country to avoid a specific regulatory agency. The senior management group may establish buffering mechanisms to absorb and deflect some external demands. Conversely, they may merge with other units or develop strategic alliances to increase their power. These tactics may or may not be related to the official goals of the organization. However, senior management will most likely provide a realistic scenario linking these power enhancing moves to official goals. They will construct a socially believable story.

While power/dependence can be viewed exclusively as an aspect of emergent structure, the power and control mechanisms within hierarchical systems appear particularly important. Thus, in chapter six, the discussion on causal mechanisms will highlight power and control issues.

The Culture Variation. Another important variation in the literature concerns the analyses of "organizational cultures." Essentially this group of scholars seeks to understand the broader overall context of the institution through the eyes of participants.

While there are many different views of organizational culture, many analyses focus on two different important issues for participants at three levels of analysis. Individuals within organizations need to collectively understand how they adapt to external requirements (called external adaptation) and how they work together (called internal integration). As Schein (1985) notes, the requirements for external adaptation and internal integration may be manifest at three levels of analysis. These levels of abstraction are called (1) observable culture, (2) shared values and (3) common assumptions.

The observable culture includes the stories, rites, rituals and symbols of the participants. These observable aspects of culture are expected to reflect shared values. The term "shared" does not mean that all members believe, accept or will defend common values. It only refers to the expectation that all members have been exposed to a specific set of values.

Analyses of shared values can be divided into two quite different streams of research. One body of work emphasizes the values that emerge from the organizational experience. A second body of work stresses the values senior management would like members to adopt. This second line of research emphasizes the so-called "strong culture" hypotheses so popular in the business press of the 1980s (e.g., Deal and Kennedy, 1982). Here, senior managers were charged with developing a competitive advantage through a "strong culture". Senior management was expected to mold shared values toward the goals they selected.

The third level of organizational culture analyses is much more difficult to describe. It centers on shared philosophies and understandings of the world. These shared meanings many not ever be expressed directly. However, they form a foundation underlying shared values and observable culture. While most organizations are expected to have a distinctive observable culture, it is rarer to find a singular pattern of shared values. An organization-wide common series of understandings would be quite unusual.

In contrast to a singular culture at all three levels of analysis, many writers expect to find a mosaic of comparatively distinct cultural groupings. These groupings may correspond to those already identified for other social constructionists' views. Divisions by organizational level and by unit function are to be expected.

In short, the culture of the organization is both an outcome of prior experiences and a precursor to the future directions of the members. It is expected to moderate the design of the organization and its relationship to criteria. Further, the ability to successfully alter the organizational design may partially rest on the seen and unseen aspects of culture. Attempts to alter the organizational design need to consider the existing patterns of external adaptation and internal integration at all three levels of cultural abstractness - the observable culture, share values and shared understandings.

Institutional variation. Studies in institutional sociology have demonstrated that organizations selectively transfer key elements of existing societal systems inside their

boundaries. Such selective incorporation reflects the importance of establishing legitimacy with key constituencies in the organization's technical and institutional environments (Scott, 1992). Organizations are most open to external influences at their founding, as well as during times of crisis and threats to survival.

Institutional forces can be viewed exclusively as an emergent factor in organizational design, but the powerful forces to conform to social dictates and to obtain legitimacy also need to be considered. In Chapter VI, the analysis discusses institutionalization as a power causal force influencing both the planned and emergent aspects of organizational design.

RADICAL VERSUS EVOLUTIONARY CHANGE

Each of the approaches described above presumes that the organization will tend toward some sort of equilibrium or move in a particular preset direction. Each begins to provide substantial insight into the evolutionary directions of the organization.

Part of the problem with these current approaches is that they do not explain and predict fundamental changes in organizations. As organizations confront global competition, their environments are often quite different. Both the general and specific environments change dramatically and they confront new institutionalization pressures that all members find difficult to comprehend. The pace of technological development is much quicker in the 1990s than ever before, and many more new technologies are being brought into commercialization. Once, changes in technology were confined predominantly to the production processes of organizations. However, a wave of new computer based information technologies is now being dispersed quickly throughout larger corporations and pressing middle management to change or die.

Strategists are beginning to realize that mere adjustments in the structure of the organization are simply insufficient to cope with the combined impact of environmental and technological change. They are beginning to redefine the boundaries of the organization. They are reconsidering how to compete and where to operate. The unitary, vertically integrated hierarchy they once envisioned as the organization is giving way to a more flexible, dispersed alliance and network vision of the organization. Positioning of competencies within a network is displacing the notion of economies of scale.

In different terms, structuring a pattern of alliances within a value added network is becoming a strategy. The old division between strategy and structure is fading as implementation potentials drive what executives want to do. This is not merely a change in the organization chart or some new variation on existing patterns of strategy, but a new way of doing business.

The old linkages among environment, context (size & technology), strategy, structure, and emergent processes is being fundamentally altered. How one structures and manages a network of alliances is becoming one of the major research issues of the 1990s since this

appears to be a primary mechanism for surviving fundamental change.

In part, the more traditional views of organizational design are being challenged by organizational needs to retrench, learn, innovate, and manage alliances. Thus, Chapter V will discuss each of these change issues in considerable detail.

STUDIES OF MANAGEMENT PROCESSES

With the fundamental changes facing corporations there is a tendency to return to an old tradition in the analysis of organizations. Specifically, some wish to return to the study of management processes. Some would attempt to identify what processes managers should take to move their corporations from the static, overly rigid bureaucratic systems toward the new flexible, dynamic network arrangements.

The chief difficulties with studying management processes are threefold. One, a focus on managers and what they do may ignore the larger organizational, environmental, and technological forces shaping the problems, constraints, and opportunities facing organizations. As several scholars have noted (e.g., Brown and Mitchell, 1986), research may be as guilty as managers of attributional errors. Namely, researchers may attribute high performance to managers and the processes they perform and poor performance to externalities.

Two, over-emphasis on managers may place entirely too much emphasis on the hierarchy of the organization and the realities constructed by managers. What may be entirely sensible to the managers may not be viable on a larger plane. *Micro-rationality* can yield nonsense.

Three, the study of processes implicitly calls for the research to subscribe to an underlying philosophical position. Van de Ven and his colleagues (Van de Ven, Angle, and Pool, 1991) suggests from his review of over 2000 articles that researchers tend to follow one of four models: (1) A life cycle view where there is a unitary sequence of stages moving from one to the next in some prescribed manner; (2) a teleological model where there is a desired state that individuals will choose and incrementally move toward; (3) a dialectic model where cycles of thesis/antithesis/synthesis yield conflict between contradictory values or events to produce a pluralistic outcome and (4) an evolutionary model of natural selection where recurrent variation, selection, and retention yields unknown temporary outcomes. All of these need to be considered in studies of organizational processes.

All too infrequently, research studying processes fails to incorporate the (a) rich mosaic of multiple influences in, on and around entities (and counter attributional biases), (b) the perspectives of non-managers and (c) elements from all four popular perspectives. In short, the systematic study of managerial processes needs to be incorporated into a larger and more complete theoretical framework that recognizes multiple causal influences. Chapter VI provides such a framework and should help move research in more viable and productive ways that reliance solely on the attributions of managers.

SUMMARY

By far the most popular view in texts on organizational design is based on the purposes of the organization (e.g., Daft, 1990; Mintzberg, 1979; Osborn, Hunt and Jauch, 1980). Here, the structure of the organization is a key mechanism for accomplishing organizational goals. The structure needs to consider vertical specialization and control plus horizontal specialization and coordination.

A number of purposive views were reviewed, including those by Burns and Stalker, and Mintzberg. Burns and Stalker emphasize the degree to which the structure is organic (horizontal differentiation and coordination emphasized) or mechanistic (vertical specialization and control emphasized). Mintzberg emphasizes the different roles of top, middle and bottom ranks across line and staff by the different goals of the organization.

These views from the top of the organization can be supplemented by asking members how they view structure. Here, issues of centralization/decentralization, standardization, and formalization are extremely important. Of course, these bottom-up views can also be supplemented by those that derive the structure from the strategy of the firm.

The emergent aspects of organizational design were then discussed in detail. Based on social constructionism and negotiated orders, the dimensions of structure reflect the enhancement needs of members. After discussing the theoretical foundations of this view and how organizations absorb social constructions, three related views were discussed. The power/dependence variation emphasizes the power and control dynamics of hierarchies and concentrates on senior management. The cultural variation examines how individuals cope and reach toward goals at three different levels of analyses. The observable, shared values and shared understandings aspects of culture were discussed. Finally, the institutional variation was mentioned again. Here, it was noted that institutionalization is a potentially very powerful force in understanding organizational designs and structures.

The discussion concluded with brief mention of differences between radical and evolutionary change and the difficulties of studying managerial processes. The difference between the currently popular approaches and the need to reconceptualize organizational structure under dramatic change is so great that Chapter V discusses four change issues in detail. These are retrenchment, organizational learning, innovation, and strategic alliances/networks.

The next chapter continues on this introduction with a more complete discussion of some key questions raised in the statement of work.

CHAPTER III

ISSUES RAISED IN THE STATEMENT OF WORK

If the Army faces substantially declining resources and a more diverse series of potential threats, it seems logical to ask whether the current literature systematically addresses questions that organizational designers would naturally raise. These include, but are not limited to, (1) rapid design and redesign, (2) analytic in addition or opposed to qualitative/subjective approaches, (3) criteria or assessment measures to know when the design/redesign effort is finished, (4) the availability of graphic and analytical methods for the development and description of designs and (5) typical approaches common in the civilian sector (whether they are supported by research or not).

To assess these issues, we first systematically updated existing literature reviews with a computerized literature search. After this search, we systematically addressed each of these issues. The chapter is organized around these five issues.

RAPID DESIGN/REDESIGN

The rapidity of design changes has not been systematically addressed as an independent research issue in the recent literature. However, the need for rapid design change is becoming obvious to research and this is an important topic mentioned by experienced scholars (see Research Note 94-16, appendix A). The degree to which organizations can change their structures and design quickly is a major research topic that will be addressed in the Task II report. It is also discussed in chapters V and VII under statics and dynamics of organizational analysis.

For this chapter, the discussion focuses on the overall chances of a rapid redesign. Rapid design change may be considered successful depending upon the definitions of success, the extensiveness of the attempted changes, and the frequency of organizational design changes. Each of these will be discussed.

Frequency of Change and Success

On the surface it would appear that the prior frequency of design changes would be inversely related to estimates of success. However, work by Schoonhoven and her colleagues (e.g., Jelineck & Schoonhoven, 1990), suggests that comparatively small Silicon Valley high tech firms often reorganize so that over time they appear to have a very flexible and responsive structure. At any one time, however, the overall design is comparatively rigid, specified, and mechanistic. The frequent redesigns allow the firm to cope with a turbulent environment using a staff that is accustomed to change.

Conversely, large organizations with a record of comparatively stable designs appear to have considerable difficulty in altering their formal structures. For instance, AT&T has

struggled for almost a decade to readjust after the federally mandated agreement to reshape its boundaries. Reports by Chandler (1962), among others, suggest that dramatic changes in the organizational designs of large diversified firms may take decades to successfully implement.

Design Change and Other Changes

Part of the problem of assessing the rapidity of design independently is separating this change from other alterations. Designers may alter the formal structure of the organization in response to a number of general environmental trends, the strategy of the organization, emerging technological forces, or to improve specific organizational outcomes. Perhaps one of the most interesting issues is the relationship among the strategy and structure of the organization.

Strategy and Structure Changes. In one sense, a change in organizational design may be part of a larger picture involving fundamental changes in the strategy of the firm. That is, structure follows strategy (e.g., Chandler, 1962). While it is possible for large organizations to change strategy frequently, such is rarely the case since the system must overcome bureaucratic inertia, among other factors (Jauch and Glueck, 1988).

Many internal changes in the strategy/structure alignment appear to occur with alterations in the composition of senior management and these same individuals are often the ones who rate the success of the attempted change (e.g., See Huber and Glick, 1992, and Jauch and Glueck, 1988). In different terms, since large organizations tend to keep a consistent strategic thrust, they are less likely to fundamentally alter their structures.

The role of senior management in altering strategy and subsequently redesigning the organization has been studied extensively for very large U.S. corporations (See Chandler, 1962). These historical analyses show a very uneven linkage between strategy and structure as the strategies of the firms tend to shift, yielding implementation problems. To reduce the complexity facing senior managers, the overall structure of the organization may be subsequently altered. While this rational model of design appears straightforward, there appears to be a number of other factors involved. A more complete discussion of strategy/structure linkages may be found under the literature review on strategic choice.

Adjustments to Size and Technological Factors. While there is a large body of research under the title "population ecology" that questions the ability of organizations to dramatically alter their organizational designs (See Chapter IV), it is quite obvious that the organizational designs of firms often are adjusted to evolutionary changes in technology and size. Greater size and more technological sophistication have been related to a more elaborate and sophisticated design (See Osborn, et al, 1980 for a review).

Certainly as the size, technological sophistication, and variability increase, so does the difficulty of rapidly changing organization-wide structural patterns. Furthermore, the more bureaucratically entrenched the existing middle and lower managers are, the more difficult it

is to rapidly change methods of doing business. In part, this resistance is a reaction against change, but it also may well suggest that precisely how the organization accomplishes its goals and how top management thinks it runs may be fundamentally different. Middle and lower managers may have developed an emergent system that works. If designers propose a structural change, the proposed design may or may not yield all of the desired outcomes and it may well not specify the work-flow, advisory, and informational linkages middle and lower managers need to produce desired outcomes.

What is often called an organizational redesign typically does not call for a systematic realignment of all roles, jobs, positional relationships, coordination or control mechanisms. Instead, these changes tend to be located at the top, in the middle, or toward the bottom of the organization in either the line or the staff units. For instance, Chandler's historical analysis of the strategy and structure of large U.S. corporations documents a change to the divisional structure. The middle and bottom of these organizations were rarely touched. Instead, the reconfiguration of top management involved a reassignment of some staff and line duties into a new pattern. Instead of functional heads assisted by "product knowledgeable" staff, we find division heads (collections of related products) assisted by functional specialists.

Current reorganizations often mentioned in the popular press under the rubric of "downsizing" are not so much concentrated at the top of large firms but involve the middle and lower portions of the organization (after a decade or more of transferring manufacturing jobs outside the firm). These changes appear to be mainly in response to alterations in what the firm produces, how it controls individual operations, and how it coordinates them. The large and growing body of work on retrenchment and downsizing (see Chapter V under retrenchment) suggests that how reorganization is accomplished and whether it moves the firm toward new horizons is much more important than the rapidity of design change.

It is also important to note that some structural change in organizations often occurs with comparatively little notice as the firm attempts to adjust its design to small changes in the environment or context (strategy, technology and size). Comparatively minor adjustments in control and coordination systems or the degree of centralization/decentralization often can be implemented with minimal disruption.

Externally Induced Changes

Externally induced changes in organizational design often appear to be the result of (a) changes in ownership such as after the sale of a division, (b) alterations in the prospects of the firm due to a shift in demand and (c) alterations in technology used by others. The nature and extent of the shift again appears to be more important than the rapidity of design. Overall, dramatic shifts such as a fundamental shift in demand or a revolutionary change of the technology used by others appear to overwhelm the capability of existing large bureaucracies to redesign (See Chapter V for a discussion).

Superficial Redesign. Following a specific threat or performance problem, organizations often appear to redesign. For instance, when spotlighted as inadequate, bungling or incompetent, government agencies and private organizations alike often restructure in an attempt to appear to respond to criticism. Changes in the most senior levels of government, such as a change in the President of the United States, denote a policy shift and may be followed by a reorganization emphasizing new themes. Often these reorganizations are considered "successful" when the pattern of vertical authority relationships appears to have changed. Whether the overall patterns of vertical specialization and control or horizontal specialization and coordination have been altered is a quite different question.

Comparatively simple changes in vertical authority relationships without alterations in controls or horizontal coordination mechanisms are easy to institute, but they rarely change the design of the organization. The design of an organization of any size and sophistication is the result of a number of complex interdependent factors. Some of these are within the control of senior management while others are not. Direct attempts to merely alter the "table of organization" to show change often do not address the factors immediately beyond the direct control of the designer.

Rapid Fundamental Changes. The most frequent response to attempted rapid and fundamental changes in organizational design resulting from dramatic alterations in environmental or technological conditions is death. Organizations are not easily manipulated instruments that readily respond to fundamental changes. As Tushman and Anderson (1986) document in their analysis of punctuated equilibrium, existing organizations have extreme difficulty recognizing and adjusting to fundamental shifts.

If large bureaucracies are expected to maintain high performance in a highly turbulent settings, much more work on retrenchment, learning, innovation, and strategic alliances is needed. These are discussed in detail in Chapter V.

Alterations in Interorganizational Relations. There is a growing body of literature concerning interorganizational relationships that posits a slightly different view of rapid organizational redesign. Under highly turbulent environments and technologies, several scholars suggest that the very nature of the firm changes from a quasi-independent entity toward the view of the firm as being positioned within a network (See Osborn and Baughn, 1990, for a review).

Given the limited ability of organizations to quickly readjust all of their internal components, another strategy is to decompose the organization into a series of interlocking value-added networks. Linkages among network members are managed via a series of quasi-organizational mechanisms including joint ventures, technical agreements, partial ownership arrangements and philosophical ties. Examples of these networks include the Japanese Keiretsu and the Korean Choabals. Eccells (1988) notes that whole industries, such as the construction industry, may successfully operate as a network of relationships.

A chief advantage of an established network is its ability to very quickly configure and reconfigure to meet specific opportunities. Such networks appear to have a disadvantage in efficiency compared to more standard bureaucratic forms and they also appear to extract substantial costs from members (e.g., periods of slack and unemployment). Further, the research concerning these types of entities is in its infancy. We simply know very little about how these networks operate to rapidly configure and reconfigure.

Summary

Research is needed to place the issues of design rapidity within a more comprehensive theoretical framework and to study it as part of a larger series of questions. Specifically, a theoretical perspective that specifies the elements of the design, the criteria for success, the factors pressing on the design and the likely types of change processes that can occur within the organization from both internal as well as external sources is needed. While it is comparatively easy for senior management to contrive measures of success to meet existing circumstances, the direct relationships among the rapidity of change in specific design elements and specific measures of success such as efficiency, quality and the like remain unknown at this time.

Finally, it appears that organizations constantly facing the necessity to rapidly alter their organizational designs decompose into networks of organizations. The design of various networks and the performance characteristics of different network forms will likely become an important research issue in the 1990s. Analyses of these alliance structures also needs to be informed by more systematic work on retrenchment, learning, and innovation.

ANALYTICAL AND QUALITATIVE APPROACHES

Throughout the 1980s there was considerable debate concerning the use of qualitative and quantitative approaches to the analysis of organizations. For a time, it appeared that researchers were facing a choice of methods since the theoretical bases for much of the research focused attention on either qualitative or quantitative approaches. For example, researches studying organizational culture tended to rely exclusively on qualitative methods to "discover" shared emergent elements describing portions of the organization. Conversely, those studying strategy/structure relations tended to test these relationships with a combination of questionnaires and secondary data.

In the last several years the linkage between methods and theory has become more robust so that qualitative approaches have been used mainly to help build theory while quantitative approaches have been relied upon for testing. In many cases, studies will include both methods in an attempt to secure detailed, in-depth information stemming from qualitative approaches as well as the reliability, replicatability, and precision of quantitative approaches.

ASSESSMENT MEASURES FOR EVALUATING PROPOSED STRUCTURES

In the popular literature and in the computerized literature review (See Appendix B), there is typically little mention of when the designer should know if a design is complete. In part, this is because the organizational design is often considered to be an evolutionary tool rather than a fixed set of relationships. Further, most researchers recognize that the design intended and authorized by senior management is often incomplete and rarely, if ever, implemented as intended. Further, the design needs to respond to a number of environmental and contextual factors and provide sufficient flexibility for learning and improvement.

Despite these cautionary statements, outside reviewers may use an assessment protocol developed for the Nuclear Regulatory Commission to evaluate proposed structures (See NUREG/CR 4125). This document was developed to assess the technical aspects of whether a proposed organizational design would assure safe operations of a nuclear plant. To these technical criteria, the analyst may also be interested in the extent to which the proposed structure meets a number of systems and strategic criteria implied in the current literature. Thus, the response to this concern is organized around technical, systems, and strategic criteria for evaluating a proposed design.

Technical Criteria for Assessing a Proposed Organizational Structure

Based on a systematic review of the organizational literature in the mid 1980s, researchers for the Nuclear Regulatory Commission proposed three broad technical criteria for the assessment of proposed organizational structures. Here, the organizational structures are viewed as a mechanism for accomplishing work (i.e., will the structure facilitate the accomplishment of the proposed work). Proposed organizational structures were evaluated by the agency as part of its process of granting licenses to utilities with commercial nuclear power plants in the United States (See NUREG/CR 4125). The three criteria were labeled standards for (1) Completeness, (2) Adequate Rationale, and (3) Achievability.

Standard of Completeness. This is a comparatively simple standard which asks the proposer whether all elements from the theoretical approaches underlying the structure have been considered. The Nuclear Regulatory Commission had a series of functions for the proposer to consider and also asked how these functions were to be controlled and integrated with each other.

Within the overall standard, analysts were asked whether the planned structure considered (a) all objectives, (b) all functions, (c) all relevant units of analysis such as the plant, the nuclear operations and the utility as a whole, (d) all variables and (e) all relevant issues.

The list of variables included the management processes of organizing, coordinating, controlling, and improving operations via individuals, administrative policies and procedures, organizational units and structures, or external units and individuals. Applicants were required

to be able to describe their use on a four by four matrix (the four management process variables of organizing, coordinating, controlling, and improving by the four types of resources including individuals, policies and procedures, internal units, and external units) for their plant, the nuclear portion of the utility, and the utility as a whole. For instance, applicants were asked to describe the policies and procedures used to promote coordination across such units as operations and maintenance within the nuclear plant. If no policies or procedures were employed for coordination, the individuals, internal units, or external units asked to perform such duties were to be described.

When applied to a list of concerns supplied by the Nuclear Regulatory Commission (such as fire protection, qualifications for plant operators, and fuel loading), the analytical procedure can provide a check on whether the applicants have thoroughly considered how the plant is to be effectively managed for high performance. To help individual designers, this document also includes guidelines for the development of organization charts, since the nuclear utilities had not been following any standard procedures.

Standard of Adequate Rationale. A series of studies commissioned by the Nuclear Regulatory Commission did not show that any particular organizational design yielded superior safeness. A variety of structures were used in the industry with a variety of safety results. Thus, design choices were subjected to a sliding scale of rationales or justifications for specific decisions.

The mix of choices for any particular unit (e.g., the plant) across the range of resources (individuals, units, policies/procedures, and external units) for any activity (e.g., coordination or control) should be supported in some way. The types of support were hierarchically arranged, from (1) best to (4) worst, as follows: (1) a study or reference to a well-designed and executed analysis relevant to the issues at hand, (2) formal reasoning or analogies derived from practices elsewhere with an explanation of why the other situations were relevant, (3) managerial judgment or the professional preferences of managers based on accumulated experience or institutionalized practice and/or (4) externally imposed administrative requirements and/or practices.

This standard was explicitly proposed to identify where different types of rationale were used. Preliminary use of the document suggested another unacceptable but understandable rationale - command decision by a higher level without justification. Where this rationale was used the proposed structure often did not mesh with the existing technology but tended to match a much simpler one originally established from fossil operations (see Osborn and Jackson, 1988).

Standard of Achievability. Reviews of organization charts suggested that they often explicitly detail authority relationships and duty assignments to specific units. They rarely detail the flows of work across the organization, the patterns of coordination or the informational connections needed to successfully operate. Thus, an additional criterion was added to see if the proposed structure would yield the desired results.

The Nuclear Regulatory Commission document (NUREG/CR 4125) asks whether the current plan is achievable in two different ways. In light of the resources available to the system, will the design accomplish its tasks? How will these tasks be accomplished? Further, the standard includes whether individuals asked to operate within the proposed design understand it and can successfully conduct their roles within it.

As this last standard suggests, even the most carefully structured organization relies upon managers and workers to bring it to life and make it work. The broader literature on organizations suggests that even with a poorly designed organization, the individuals can develop methods to reach toward task accomplishment. In this light, a whole different series of standards can be applied. These standards attempt to deal with the organization as a whole rather than focusing on the specific components. These are called systems standards or criteria.

Systems Criteria for Assessing a Proposed Organizational Structure

Systems criteria deal with whole parts of the organization and attempt to assess the extent to which the organizational structure promotes internal characteristics that have been related to organizational accomplishment (See Osborn et al., 1985). While there are many different systems properties that might be used to judge a proposed structure, much of the literature appears to focus on consistency, integration, responsiveness, and learning.

There is a variety of systems approaches that specify the types of conditions or characteristics of organizations that yield success and survival (See Chapter 4 for a review). One approach is to specify all the various constituencies needed to support the organization and derive the organizational attributes called for by these interests. For instance, owners want returns while employees want salaries, customers want high quality, inexpensive goods and services, and many governmental agencies want to see the organization contribute to a larger notion of fairness and societal development. Another approach is to study the systemic characteristics of organizations to isolate specific characteristics that are related to success. Both approaches suggest that there is a variety of organizational designs that are associated with organizations considered successful. That is, no single design is preferable and the organizational design needs to be analyzed in light of a number of other important internal and external factors.

Criterion of Systems Consistency. Any complex organization faces a number of challenges, requirements and opportunities. It needs to balance these across a wide variety of constituencies and still meet its intended purpose. The criterion of systems consistency attempts to systematically analyze the role of organizational structure in balancing these competing demands. While the standard of achievability emphasized technical aspects of goal attainment, the standard of systems consistency seeks to analyze the counterweights to an over-emphasis on any specific attribute of the organization.

- **An Example of Systems Consistency.** There is a variety of analytical frameworks that may be used to judge consistency. For instance, Quinn and Rohrbaugh (1983) link specific attributes of organizational structure to larger competing constituencies that the organization must satisfy. The consistency criterion would be used by the analyst to judge the degree to which all of the competing demands, constraints, and opportunities can be met. To continue the example, Quinn and Rohrbaugh (1983) suggest that organizations need to be adaptive, respond to external concerns (e.g., be competitive), reach specified goals, integrate functions, respond to internal concerns (e.g., promote stability), and promote individual development. Each of these criteria can be linked to an attribute of organizational structure. To be adaptive, the organization must maintain flexibility and readiness backed by a growing external acquisition emphasis. To attain specific goals, the organization must plan and develop an efficient way of producing desired products and services. The organization must also provide sufficient stability to link related functions consistently. The organization must also provide for human growth and development or it will lose the very individuals so necessary for adaptation, goal attainment, and integration.

The desired characteristics of an organizational structure may be seen as representing competing values. Specifically, goal attainment is counterbalanced by the necessity to maintain pattern-maintenance and reduce internal tension. The internal focus on harmony is often opposed to an external focus on external concerns (such as competitiveness in the case of private organizations). Adaptiveness is opposed to internal integration. To maintain a "sufficient" balance, the analyst is asked to demonstrate how the proposed design emphasizes a particular area and still provide for a sufficient counterweight to reach the competing characterizations. The system designed to adaptation, thus, should have provisions to promote internal integration. Organizational designers who have emphasized meeting specific efficiency goals must also show the counterweights to provide an adequate emphasis on human growth and development.

- **Difficulty in Assessment.** This is probably the most complex, least researched system standard. Yet several clinical studies suggest that effective organizations are able to develop designs that simultaneously meet several apparently competing standards (e.g., Daft, 1990; Mintzberg, 1979; Osborn et al., 1980). For instance, the Army has long linked morale to combat effectiveness. It has emphasized individual command initiative within a rigid hierarchy that promotes control. Clearly, much more research is needed on this criterion for judging proposed organizational designs.

Criteria of Systems Integration. To gain synergy, the various parts of the organization need to work together as a whole. All of the parts need to fit together. This criterion simply asks the designer to demonstrate how the proposed structure links units and individuals together up and down the organization as well as across organizational units in different work flow chains.

For example, how does the strategic development often emphasized in analysis of higher commands mesh with the units needed to integrate these strategies. How are the

initiators to know the "intent of the commander" and how is the commander to know the zones of initiative that implementers will exercise. In a complex machine bureaucracy, such vertical integration is often to be accomplished by policies, procedures and controls followed by elaborate feedback mechanisms under the presumption that the organization faces a series of known demands, constraints, and opportunities.

The degree of horizontal integration is often more difficult to show, as existing organization charts or tables of organization rarely show the flow of work from one part of the organization to another. How the vertical and horizontal pieces of the design fit together in a practical way to demonstrate how work will be accomplished is even more difficult for most designers.

Criterion of Systems Compatibility. While an organizational structure can be a plan for conducting work and reaching toward specified objects, rarely can any designer fully anticipate all situations and/or the interpretation of the design by those who use it.

Each organizational design should have provisions for identifying and reacting to alterations in the environment, technology, size and issues facing the organization as it operates. Specifically, how will alterations be identified and how will adjustment be attacked? At a more sophisticated level and with more sophisticated organizational structures that facilitate emergent action, answering this question can become quite difficult. Instead of showing how a plan or program will be implemented, the designer will need to show how collections of units will join together to meet conditions not explicitly recognized in the original design (See Burgelman, 1983).

Criterion of Systems Evolution. From recent work on organizational learning (See Chapter V for a review of this literature), designers need to recognize that a planned design should facilitate learning. How will the design facilitate each step in the organizational learning process (e.g., identification of the issues, recognition of alternatives, decision making, implementation and retention of the lessons learned) so that responses show a virtuous cycle of improvement rather than either a destructive magnification of problems or repeated ad hoc choice?

Since the literature on organizational learning is still forming, considerable research is needed to identify which design elements are essential to organizational learning and how organizational design facilitates the learning process.

Strategic Criteria for Assessing Proposed Organizational Designs

While technical criteria center on task accomplishment and systems criteria emphasize those conditions that are likely to yield survival and success, strategic criteria deal with the organizational design as an instrument for implementing the strategy of the firm. Will the design yield the desired strategic result? If so, how will this result be accomplished through the proposed design.

While the term "strategy" appears to have a clear definition and meaning in military circles, such is not the case in the organizational literature. Instead, different writers have approached the definition, measurement and assessment of strategy in quite different ways. In much of the current literature, strategy may be linked to (1) a vision of the future, (2) a specific goal, (3) identifiable capabilities, (4) implementation of a specific plan, and/or (5) continuation of a specific pattern of emergent action. Each of these views provides criteria for the assessment of a proposed organization design.

Strategy as a Vision. In this view of strategy, those at the top of the organization are expected to have a clear understanding of how they want the organization to operate. The role of organizational design is to emphasize those traditions and institutional characteristics consistent with the vision. While this series of criteria may sound particularly illusive, the values and shared understandings embodied in these visions are often quite clear to organizational participants. For instance, duty, honor, and country are but words to the outsider and yet constitute a code of desired conduct for Army officers who are expected to lead their troops to victory.

Particularly for non-economic organizations, the clear articulation and support for a strategic vision of the entity can be an extremely important element for drawing necessary resources from the environment and from potential participants. Unfortunately, the role that vision plays for non-economic organizations has received scant attention in the literature. Yet, it is quite obvious that a whole host of societal institutions rest their very survival on such visions. Organizational structures consistent with the vision of the firm should, therefore, enhance the chances of survival. Conversely, those that run in opposition may reduce survival potential.

Unfortunately, the linkages among strategic vision and organizational design await systematic research. For instance, Mechanic (See Osborn et al., 1980) long ago offered what is known as "the iron law of oligarchy" to help explain how unions dedicated to democratically representing workers threaten their own survival by evolving into hierarchical bureaucracies. We do not know which elements, if any, of the structures of the organization facilitate specific elements of a strategic vision. Nor do we know the importance of an apparent consistency between the vision and specific elements of the organization's design. Part of this problem is attempting to explain how individuals within the organization deal with and explain a number of organizational paradoxes. For instance, how do highly centralized command and control bureaucracies thrive in a nominally democratic society?

Strategy as a Goal. In this view, the senior management of the organization is expected to specify one or a series of goals for the entity. Then, the designer shows how the proposed structure yields the intended purpose. The design should provide a clear path of implementation toward the specific intentions of senior management. The design itself should embody a clear series of subgoals and a clear definition of direction.

Strategy as Capability. In this view, strategy is defined as the development of a series of capabilities. These might include research and development prowess, the ability to market goods and services in specific countries or an adroitly adjustable management group (See Prahalad and Hamel, 1990, for a discussion).

One role of an organizational structure is to emphasize those capabilities considered desirable. For instance, designers may call for flexibility as a capability in light of a highly turbulent environment. If so the design should enhance the flexibility of the organization as a whole as well as its constituent parts.

Strategy as an Implemented Plan. At a much more mundane level, strategy has been defined as a plan for accomplishing specific targets within a specific time frame and a set resource allocation. Here, the organizational structure is assessed on the basis of whether it will provide a suitable mechanism to accomplish the target within the time, cost and resources specified in the strategy.

Strategy as a Pattern of Emergent Action. This view of strategy is quite similar to the criteria for systems evolution that are described above with one major exception. Here, the structure itself, and the ability of the structure to promote a dynamic pattern of appropriate actions by subordinates are considered an essential feature of the strategy. In other terms, the traditional distinction between strategic formulation and strategic implementation is abandoned. The implementation and formulation aspects are collapsed.

GRAPHIC VERSUS ANALYTIC METHODS

In the recent academic literature surveyed, no mention was made of new graphic methods for depicting organizational designs. Most major organization textbooks do spend some time describing organization charts or tables of organization. Here, the basic patterns of horizontal specialization are charted as are some aspects of vertical specialization. The methods of coordination and control are rarely mentioned and the linkages among units and individuals in different work flows are often absent.

Recent work on the social construction of reality and enactment (e.g., Weick, 1990), suggests that how individuals perceive the organization design is a major factor in determining their actions. More accurate visual accounts of all aspects of organizational design are needed. For instance, graphs of the patterns of centralization/ decentralization by specific issue (e.g., hiring/firing individuals, establishment of strategies, procurement cut-offs and the like) would be extremely helpful for all organizational participants.

Perhaps even more helpful would be multidimensional depictions of the work-flow, advisory, approval, and auditing relationships among units to more clearly depict the actual patterns of specialization in the organization.

New graphic methods used in engineering could be used to supplement current organization charts. For instance, using graphic displays, it is now possible to show a three dimensional model of most products using computer aided design (CAD). Research bridging the gaps between such technologies and work on control and coordination mechanisms for organizations could help both designers and participants understand the intended relationships in proposed organizational designs. These models might well be able to show work overloads on specific units, the need for more or fewer coordination or control mechanisms, and/or the impact of antiquated policies/procedures.

For example, the organization chart of a large auto firm suggested that the design of a new platform would be systematically reviewed by five levels of management before it was authorized. A new platform often involves decisions on over ten thousand parts and must be coordinated with hundreds of external suppliers. In actually, attempting to plot the number of levels and the individuals that had some authority to alter the design, it was found that some nineteen levels of management were actually involved in three different chains of command. It was little wonder that the development of such a platform took over five years. In comparison, a competitor had streamlined the organization of platform development into major components with an integrative unit to resolve the natural differences between engineering, design, marketing and the like. Using individuals from these areas within a coordinating unit, the decisions on a platform were coordinated and the number of approval levels was cut to three in two chains of command. The time needed to develop a platform was reduced to some three years. Until the actual approval processes were graphically depicted and senior management understood how a platform was actually designed (versus their mental image of what they thought was done via the standard organization chart), little progress was made in streamlining the development process.

In a very preliminary study at the small unit level, the potential power of graphic approaches was demonstrated by Robinson and Hawley (1984) using the AMORE or Analysis of Military Organizational Effectiveness approach. Here, simulations based on elimination of various occupational specialists and fatigue were related to unit effectiveness. The initial analyses was very predictable in that degradation in functional specialization by military occupational specialization (MOS) and command were the only requirements analyzed. However, the work did point toward more interesting graphic approaches using computer simulation to study the dynamics of different types of requirements

ASSESSMENT OF CURRENT METHODS USED IN THE CIVILIAN SECTOR

The computerized literature review explicitly included a vast number of practitioner journals in an attempt to capture current proposed methods used for organizational design in the civilian sector. It is quite clear that the typical organizational design methods rely heavily upon executive judgment, often supported by specialized consulting firms. Each of the firms appears to have a somewhat unique approach to organizational design. However, upon even the most superficial analysis, it is quite clear that the recommendations are some combination

of existing practice by other firms in the industry combined with an estimate of client desires and a common textbook type approach to organizational structure.

Organic and Mechanistic Models

There is a wide variety of text book approaches to organizational design. A simplified version of Burns and Stalker (1961) is used by some firms. Here, the firm is depicted in terms of two opposing models. The first is a mechanistic model emphasizing the bureaucratic and control aspects of design. The second is an organic model emphasizing coordination, decentralization, and flexibility.

Mintzberg's Typology

A second popular approach is to utilize Mintzberg's (1979) typology of organizational types. Mintzberg divides the organization into five components. Vertically, there is the operating core, the middle line and the strategic apex (line work units, middle management and senior management). Attached to the middle of the organization are the technostructure and the support staff. Different configurations of the components yield five different organizational ideal types. As discussed in an earlier section (Dimensions of Planned Design), these types include simple structure, machine bureaucracy, professional bureaucracy, the divisional form, and adhocracy.

Comparatively few consulting firms use this terminology and most recognize that none of the ideal types will ever be used directly in practice. Instead, they package combinations of the five models for different parts of the organization under slightly different mechanisms for control and coordination.

Assessment

Overall much of the literature focusing on what firms are doing is not very helpful. It over-emphasizes a few "hot topics." It is rarely backed by systematic evidence. In too many cases, the few studies that do provide systematic evidence as a basis for restructuring suffer from selection on the dependent variable.

Hot Topics. One of the most striking aspects of the practitioner literature is the series of "hot topics." These topics appear to come in waves of popularity. For example, today many organizations are reducing their staff and technostructures in an attempt to downsize. There was once a vast popular literature on Management By Objectives (MBO), while comparatively few production organizations have escaped elements of Total Quality Management (TQM). In the middle to late 1980s, there was considerable emphasis on managing organizational culture as if senior management could direct not only how individuals would reach goals and adjust to one another but how they would hold values and beliefs (See Schermerhorn, Hunt and Osborn, 1992).

While there is a tendency to dismiss each of the popular waves of managing, several scholars suggest that organizations do "institutionalize" new approaches and some can learn to dramatically alter the way they do business. We suggest that research into institutionalization (the processes of absorbing external influences) and organizational learning would be more beneficial than attempting to study any of the popular methods for improving performance.

Lack of Empirical Support. Two of the most serious deficiencies in the practitioner literature center on the (1) lack of actual studies to support claims and (2) selection on the dependent variable. Case examples are often confused with rigorous analytical studies. Frequently, reports of "success" are provided without a clear definition of the term or precisely what one might expect from the proposed change. The waves of popularity appear to stem more from reports by consultants selling their programs and aspiring managers seeking promotions than by the identification of superior methods.

Selection on the Dependent Variable. Selection on the dependent variable is a much more pervasive and subtle problem. Essentially, the problem may be identified as follows. The reporter selects a "successful" organization and then plots its actions against some traditional practices and/or a series of "less successful" firms and promotes the differences between the systems as the keys to success. To reiterate, sample selection is on the basis of the outcome measure or some vague notion of desired outcomes. Differences in attributes between the successful and less successful organizations are often called determinants of success. Thus, if the successful organization has a "positive culture" while the less successful one does not, possessing a positive culture is identified as a determinant of success.

- An Example of Selection on the Dependent Variable. It is not at all unusual for a particular firm to move from the less successful to the successful category without substantially changing its strategy, organizational design or the like. For example, one firm, [name deleted], was considered by the Nuclear Regulatory Commission (NRC) to be a very poor example of managing a nuclear power plant. The NRC charted selected practices within the organization and labeled these as examples of poor management. Lack of a strong, clear command and control system was an example. A few years later, the same firm was again examined as an exemplar of good management for a study of high reliability organizations. This study again noted the lack of a strong, clear command and control system but reported that the "organization's culture" provided for the necessary direction over individuals that bureaucratic controls and commands from off-site managers could not adequately perform. What was considered a weakness before was now considered a strength.

In contrast to these two studies, an empirical investigation by Osborn et al. (1991) suggested the resources devoted to nuclear operations had been historically high and that managers in this firm had confronted a number of myths in their attempts to develop a continuous improvement program. Their actions were consistent with those of other utilities and were (with others that had similar resource allocation patterns) empirically related to lower levels of violations issued by the NRC. However, the empirical work did not show a

relationship between these variables and the reliability of the plant, radiological exposures to workers, or the most severe category of incidents (major mistakes).

- **The Need for Additional Work.** To ascertain whether the variables identified in studies that rely upon selection of the dependent variable are related in a systematic way to objective measures of performance calls for additional work. Rarely is such additional work performed. Instead, one poorly designed study is followed by another so that the lists of desirable attributes tends to multiply over time. If these are consistent with the "institutionalized" explanation of managers, consultants, and researchers, they tend to be adopted by organizations whether they are related to specific criteria or not.

For instance, Management by Objectives was once isolated as a mechanism for corporate success based on "studies of the dependent variable." Now it is an example of a "poor" management practice that stifles flexibility, empowerment, decentralization, and an emphasis on quality. After thirty years of research, the field still does not have (1) a precise definition of MBO, (2) a clear understanding of what, if any criteria, it may be related to, and (3) the relation among the by-products of MBO and larger corporate-wide measures of "success."

In sum, selection on the dependent variable is so popular because it appears to isolate differences between "good" and "poor" performers in such a way that if the "poor" performers would mimic the "good" ones, they too could be successful. For those who might still doubt the questionable value of these seductively appealing studies, consider the following. Compare the very rich with the very poor. Label the rich successful and ask the poor to emulate the rich. Presume the list includes selecting rich parents, attending elite schools, spending money lavishly, and having a divorce, among other factors. While each of these may be associated with being rich, they fail to yield a model of success that would permit the "poor" to become "rich."

SUMMARY

This chapter has discussed a number of issues mentioned in the statement of work. The ability of organizations to rapidly re-design in highly turbulent settings appears to be a major research issue in the 1990s. Both analytical and qualitative approaches should be used in future work, as they can complement one another.

The chapter provided an expanded discussion of how proposed organizational structures can be reviewed prior to their implementation. Technical, systems, and strategic criteria have been developed and can be used.

While some initial work on graphic approaches to organizational structure have been conducted, this too appears to be another important research area of the 1990s. The chapter outlines several ways to approach use of graphical methods. And this topic will be discussed in greater detail in the Task II report.

Finally work in the civilian sector was reviewed and common problems were identified. Perhaps less stressed in this discussion was the variety of different experiments conducted in the private sector. While these experiments are rarely backed by systematic research, they do provide a wide variety of organizational structures and should be studied in future research. It is proposed that systematic analyses of organizational structures and designs should replace the apparently haphazard approach that dominates in the civilian sector. The next chapter reviews several important conceptual models that can be used as a basis for more systemic study.

CHAPTER IV

MID-RANGE THEORIES

Following Dubin (1969), we note the emergence of several popular "mid-range theories" in organizational analysis. These theories fall somewhere between global explanations of organizations, their actions and their components, and simple empirical observations and narrative case studies. These theories of the middle range help us understand some specific aspects of the organization. These approaches specify the criteria that scholars should be studying, the predictors of interest, and the basic causal mechanisms underlying the linkage between predictors and criteria. It is deceptively easy to focus all attention on one of the mid-range approaches. However, as Dubin (1969) warns all researchers, these are but partial explanations.

Three different mid-range approaches or theories of organizations appear particularly relevant to the issue of reorganizing existing systems. The first we label "systems approaches to organizations" since they deal with firms as if they were mechanisms for receiving inputs, transforming these to outputs, and coping with externally induced changes. These views often explicitly deal with organizations as if they were not composed of individuals. They provide a clear separation between macro (or organization level) analysis, and micro (or individual level) analyses.

The second mid-range approach is based on population ecology and institutional theory; it examines the degree to which the organization can and does respond to the environment. Again the emphasis is on organizations without individuals. Finally, a third mid-range theory centers on the strategic choices of senior individuals.

SYSTEMS APPROACHES

In the systems view, the organization is examined as a goal-seeking entity that transforms inputs to outputs. Thus, the effectiveness of the organization is often the criterion of interest and the environment, the transformations, the structures for transformation, and their derivatives are the predictors.

Based on the assumption that organizations must serve some social function to grow and survive, the analyst can derive a number of aspects of organizational effectiveness. For instance, organizations have some mission, some goals, and must meet some external requirements to survive. The role of senior management is to derive an appropriate contribution in exchange. Once established, the system is expected to respond to its environment, and context (size and technology) with an appropriate structure if it is to survive and reach its goals.

The chief mechanisms used to link the variables to one another center on the rationality of the members and their desire to reach goals. As rational actors, or under the norms of rationality (Thompson, 1967), one can derive a number of important organizational characteristics.

In great abbreviation, two integrative systems approaches provide an overview of this literature. The first is based on the author's open systems view of organizations (See Osborn, Hunt and Jauch, 1980).

Systems Contingency Views

To reach their goals, organizations must develop appropriate organizational structures to match the demands, constraints, and choices emanating from their environments, their sizes, and their technologies. Table X shows this, with a feedback or reward/sanction loop based on degree of goal attainment.

The Environment. The externalities confronting the organization emanate from two sources. The first is the broader socio-economic and legal-cultural setting in which it operates, known as the "general environment." The second, called the task environment, is the series of organizations with which a given firm operates. It is argued that given the assumed nature of bureaucracies, organizations prefer, but cannot always find, an environment characterized as munificent and predictable with low interdependence (reliance upon other organizations and upon the larger society).

The environment is said to be more complex as both the general and task segments become increasingly (a) more munificent, (b) less understandable and predictable and (c) interdependent (more linkages and reliance with other entities). Relying upon Ashby's law of requisite variety, it is expected that as the environment becomes more complex so must the organization or it will fail to reach its goals and, thus, die.

The Context. To accomplish its goals, the organization needs to transform inputs into usable outputs. This transformation process is the technical core of the organization. The technology may be more or less sophisticated (e.g., U.S. Civil War weapons versus those used in Desert Storm) and the organization may have one or several transformation methods (one or a wide variety of weapons systems). Again, the greater the sophistication and variety of the technology, the more complex the organization needs to become.

In a similar manner, the size of the organization is important as this measures both the scale and scope of operations. Larger organizations again need to be more sophisticated and complex.

Size and technology are often grouped together under the label "context" because (1) they may co-vary, and (2) they provide mechanisms for coping with and capitalizing upon externalities. For instance, many more sophisticated technologies require large scale

operations. Larger size is often found in more munificent environments while greater technical variety occurs with greater environmental uncertainty. Technological sophistication is more easily accomplished in conjunction with others (higher interdependence). When firms becomes larger with more and varied methods of transformation, the context is considered complex. A more complex context calls for a more complex organizational structure, holding all other factors constant.

The Structure. In this view, the structure of the organization is the relatively enduring pattern of relationships among individuals and units that acts as the mechanism for accomplishing the goals of the organization. This is a very popular view of organization structure. As noted earlier the purposive approach yields two complementary views of organizational structure. A top down view examines vertical specialization, horizontal specialization, coordination and control.

The basic rational logic still is expected to hold. Greater environmental and contextual complexity calls for greater structural complexity if the organization is to survive. More vertical levels matched with more controls in addition to greater horizontal specialization matched with more coordinative mechanisms yields a more complex organization.

It is also possible to decompose the environmental and contextual effects on various structural components. Higher environmental interdependence matches large size and tends to drive the organization toward greater vertical specialization matched with more emphasis on controls. Environmental munificence matches the degree of sophistication and drives the structure toward greater horizontal specialization matched with more emphasis on coordination. Environmental uncertainty matches with greater technological variability and tends to split the organization into separate identifiable components (increases the diversity of the structure).

Two other variations are frequently found in the literature. Variation one emphasizes how lower level workers see the organization. Here, the notions are of centralization/decentralization (to estimate vertical decision specialization) and standardization/formalization (to estimate the degree of experienced organizational control and coordination).

Variation two notes that organizations of similar degrees of complexity but different types of goals may be substantially different. Consider two very large, technically sophisticated organizations operating in complex environments. If the predominate goal of the organization is efficiency, it may become what Mintzberg calls a machine bureaucracy. Here there is a very heavy emphasis on vertical specialization and control, and employees may experience substantial standardization and formalization. To cope with uncertainty, the organization may attempt to decentralize some decision making within comparatively rigid confines. A second option is to adapt a so-called professional bureaucracy if the technology used in transformation is highly sophisticated or relies heavily upon skilled individuals (hence the name professional bureaucracy). Here, there is more emphasis on horizontal specialization

and coordination. Control is exercised predominantly through member selection. While the machine bureaucracy is expected to be more efficient than the professional bureaucracy, the latter is expected to produce higher quality.

Of course, the organization may find that its scope of operations encompasses several radically different technologies and that parts of its environment are uncertain while other parts are comparatively stable. It may be the major actor in some businesses but heavily reliant upon others in different business sectors. Some businesses may be growing rapidly while others are comparatively stable. This organization should, according to the theory, adopt a divisional or strategic business unit structure. The structure needs to be diversified.

Additional Variables. In addition to these more classic systems variables, many writers add three additional predictors. One, they note the potential importance of strategy and add it to the context. Two, they recognize the importance of a whole range of emergent processes (culture, leadership, group dynamics, organizational learning) and add these as an attachment to the structural dimensions. Three, a few writers have noted the potentially important role of alliances among firms and include alliance and network structures to their analyses.

These variables are added with often the same driving theoretical mechanisms of rationality and thus do not violate the basic tenants of the overall approach. For instance, strategy may be seen as a mechanism top management uses to provide an overall coherence to a very complex organization. Leadership analyses may be crafted toward what managers should do to promote organizational goals.

Stratified Systems Theory

Stratified Systems Theory, or SST (e.g., Jacobs and Jaques, 1937; Phillips and Hunt, 1992), takes a complementary approach but focuses on the manner in which organizations should be vertically specialized and led. While open systems views presume that managers will, under the norms of rationality, respond appropriately or their systems will die, Jaques and his colleagues attempt to focus on a missing component. Specifically, he notes that as the complexity facing the organization increases, so does the requisite complexity faced by senior management in general and the chief executive office, in particular. The CEO may not have the requisite contextual complexity and the system may not be designed to match the vertical specialization with distinct breaks in the degree of complexity facing individual managers.

The Role of Cognitive Complexity. Focusing on machine bureaucracies, Jaques and his colleagues suggest that the cognitive complexity facing the manager can be operationalized in terms of seven levels. Each level of complexity can be based on the longest time-span of feedback facing the manager. While the approach is yet to be systematically tested (e.g., are there five, six, or seven levels of complexity; does time-span of feedback accurately measure the complexity facing the manager and is it the complexity of the top management team or

the CEO that is important?), SST strongly suggests that individuals matter and the organizations need to be designed for them.

For instance, Jacobs and Jacques (1987) suggest that many organizations have too many vertical levels (e.g., many more than seven). Such over-vertical-specialization might well yield the same types of performance problems as too little vertical specialization but at substantially higher human and organizational costs. Second, the notion of some requisite cognitive complexity might be used to replace the more limited vision of centralization/decentralization to focus on how and if human managers can operate the system.

Research Issues from SST. While it would be highly inappropriate to adopt the prescriptions stemming from such an untested theoretical position, SST nonetheless could be modified to focus on the theoretical variables of interest and integrated into other companion open systems views to derive a better understanding of rational organization theories.

Given the emphasis on senior management, cognitive complexity and systems rationality, it seems clear that the SST position could easily be combined with work on "organizational governance" to isolate how senior management attempts to (1) establish the basis for strategic development, (2) specialize itself to accomplish strategic development and (3) develop itself to both recognize, adjust to, and establish systems for coping with complexity both "inside" the organization and for its network relationships.

Further, the organizational design literature implicitly, and at times explicitly, attempts to develop structures for comparatively average managers. The design is not to be altered for the limited (they are to be eliminated) or expanded for the superior capabilities of a singular individual. The design is to be adjusted to the demands, constraints, and opportunities facing the organization as a whole.

One of the real questions raised by SST is whether the complexity facing managers is a reflection of a poorly designed organization. To a real extent, leadership and organizational design are partial substitutes for one another. The leader can help pattern the values, attention and behaviors of subordinates. Organizational designs can be developed that provide functions similar to those attributed to senior leadership. For example, a network of dispersed organizations, such as those developed by the Japanese, can collectively operate as if they had a shared long term strategy. Perhaps too many western organizations are still relying upon a machine bureaucracy when they should be adopting a divisional design. Perhaps too many divisionalized organizations are attempting to keep too much within the confines of the organization and are failing to use alliances and networks to help them manage their complexity.

It is also quite possible that the "directives", initiatives or other forms of influence attempts by those in positions of authority run counter to the incentives offered by the organizational design. Burgelman (1984), for example shows that while senior managers were pressing for one type of strategy, the organizational design was rewarding managers for

developing new products and markets consistent with environmental demands. Senior management was wrong but the organization was "loosely" controlled from the top and it emerged with a new strategy consistent with external requirements. Only after this shift did senior management retrospectively construct a strategy to match prior actions. Interestingly, had senior management followed SST recommendations in the highly uncertain setting, it would likely have missed an important strategic turning point.

Given the specialization between Organization Behavior and Organization Theory, it is not surprising that mid-range theories that violate assumptions of either may be rejected by both types of scholars. With its reliance upon the notion of the complexity facing the manager, it seems quite possible to adjust Stratified Systems Theory from a prescriptive recommendation based on the time-span of feedback toward a predictive theory of when, where, how and if managers of a given level of cognitive complexity can individually and/or collectively operate highly complex organizations.

ECOLOGICAL APPROACHES

Organizational ecology emphasizes evolutionary processes underlying the diversity of organizational forms (e.g., Singh, House, and Tucker, 1986). Because organizations are seen as subject to strong inertial pressures (Hannan & Freeman, 1989), evolution in an organizational population is generally seen as reflecting differential rates of the birth and death of types of organizations. Key concerns, therefore, involve investigation of how social conditions influence the rates of creation of new organizational forms and new organizations and the rates of demise of organizational forms and organizations (e.g., Singh et al., 1990).

Historically, the focus of ecological inquiry has been on selection mechanisms affecting existing firm populations. Within the past five or six years, however, research and theory development regarding the generation of new organizational forms has blossomed (Romanelli, 1991).

Evolution is seen as consisting of variation, selection, and retention. The domain of this literature therefore incorporates issues of the generation of new types of organizational forms, their selection or elimination through mortality, merger or radical transformation and how certain forms are reproduced or retained (e.g., Carroll, Goldstein, and Gyenes, 1988).

Some researchers have distinguished literature dealing with the success of individual organizations within existing populations (population ecology) from studies attempting to account for the differential success of populations themselves, including the generation of new forms (community ecology) (see Astley, 1985). As Astley (1985) notes, populations may succeed not by efficiently replicating predecessors, but because they open up new niches and establish new avenues of development.

Building on ideas and models used to explain population changes in biological research, organizational ecology incorporates several key constructs. These include typologies

of environmental variations, form characteristics, and their fit (e.g., Singh et al. 1990; Romanelli, 1991).

Environmental Variations

The population ecology literature generally views environmental resources structured in the form of niches. As the ability of any single organization to manipulate niche characteristics or its own form is constrained, the fit of an organization to its niche strongly influences survival and therefore population characteristics (e.g., Astley, 1985). McKelvey and Aldrich (1983) define organizational environments in terms of resource pools. A niche is therefore not structured independently of a species, but represents the activity space of a form or population in adaptation.

Romanelli (1991) and Zucker (1987) note that existing resource flows may be substantially altered by any one of a wide array of events, including technological change, changes in social values, discovery or depletion of natural resources, demographic changes, legislation, political unrest, or economic growth-decline. Such changes may affect existing or emerging resource space, and therefore the forms of organizations likely to survive or develop.

Organizational Forms

While the organizational ecology literature reflects a diverse array of approaches to studying organizational forms, a few approaches have received repeated use. These include the distinction between generalists and specialists, between R and K strategists, and the use of knowledge, whether embedded in routines (Nelson and Winter, 1982) or "competence elements" (McKelvey and Aldrich, 1983) as analogues to biological genes in identifying the distinctive nature of an organization.

Generalists and Specialists. Organizations may be differentiated on the basis of whether a firm organizes its resources across a broad spectrum of the environment (generalism) or whether it concentrates on intensely exploiting a narrow segment (specialism) (e.g., Hannan and Freeman, 1989).

R vs. K Strategists. R strategists enter a new resource space at an early stage, when the population contains few other members, while K strategists enter when population members are more numerous. Brittain & Freeman (1980) have demonstrated, in a study of organizational forms in the semiconductor industry, that R-strategists were most effective early in industry development, when resources were abundant. K-strategists later displaced the R-strategists as the carrying capacity of the resource space was approached (Romanelli, 1991).

Carroll (1988) has developed a set of propositions linking political upheaval to explicit forms of organization that will likely emerge and thrive. They proposed that R-strategist

organizational forms will outcompete K-strategists during periods of upheaval, as such organizations are most able to exploit resources quickly when they first come available. Consistent with Brittain & Freeman's work cited above, these researchers proposed that K-strategists would be the more efficient utilizers of resources as the environmental space reached carrying capacity.

Institutional Theory

While the perspectives of social constructionism and negotiated orders emphasize the internal structuration within the firm, these influences cannot account for the rich variety of emergent social structures.

An institutional perspective argues that changes within an organization are designed to allow the firm to become isomorphic with the characteristics of key firms in that organization's environment (DiMaggio & Powell, 1983). Key firms, or industry leaders, establish legitimized characteristics. Organizations monitor the behavior of industry leaders and change in order to become more like these firms, and thus more legitimized. Organizations within this pattern of search behavior follow an imitative strategy.

Institutional theory (Meyer & Rowan, 1977; Zucker, 1987) holds that organizations imitate other organizations because doing so minimizes sanctions from a variety of stakeholders. Mimicry occurs particularly when technologies are poorly understood and when goals are ambiguous.

STRATEGIC CHOICE ISSUES

So far, the mid-range views described have tended to view organizations as goal-driven entities that absorb elements of design from their members and from the larger environment. It is as if no group of managers at the strategic apex of the organization were attempting to direct its overall approach to goal attainment. While critics contend that this may be an accurate picture of many large organizations, most senior managers profess to have a clear direction for their firms.

As discussed in the section on evaluating an organizational design, strategy may be defined in terms of (a) a vision of the future, (b) a specific goal, (c) identifiable capabilities, (d) implementation of a specific plan, and (e) continuation of a pattern of emergent action.

The core assumptions of a strategic approach to organizational design are that senior management should (1) direct the overall actions of the organization, (2) select and direct the implementation of a strategy yielding growth, survival and satisfactory outcomes for key constituencies and (3) facilitate the longer term future of the organization as an on-going enterprise.

These core assumptions place the senior managers at the center of organizational action and place very explicit expectations for specific types of performance. It is from this perspective that Jacques, for instance, notes the burdens of conceptual complexity placed on senior management.

Structure Flows From Strategy

Studies dating to Chandler's historical analysis of huge U.S. corporations have divided the strategic task into formulation and implementation. Organizational design is a key mechanism for strategic implementation as it is a primary tool for reaching the vision, meeting the goal, developing capabilities, or making a plan a reality. The design selected by senior management may or may not provide for the type of emergent actions so vital to the organization as it confronts events unforeseen in the strategic formulation stages.

Following from Chandler (1962) came the hypothesis that structure should flow from strategy if the organization was to be considered successful. Partial tests of the general hypothesis were quite mixed (see reviews and tests by Miller (1987) and Osborn et al (1980). In part, this is because complete descriptions of strategy and structure are difficult to obtain for large samples. Further, few if any studies systematically incorporate contextual (size and technological factors) into their designs.

Generic Strategies and Structure/Context Fits

One of the potentially more productive ways to examine strategy is to study the profiles of strategy/context and structure over time in order to isolate emerging patterns and industry variations. However, more clarity in the concept and measurement of strategy and success are needed.

Several attempts to use so called generic strategies (see reviews by Andrews, 1971; Bantel and Osborn, 1992; Hoffer and Schendel, 1978; Oster, 1982) have also yielded mixed results simply because it is extremely difficult to consistently isolate simple strategy patterns. For instance, firms were expected to follow an emphasis on either cost minimization (utilization of economies of scale), differentiation (comparatively novel products/services at higher margins), or focus (for smaller firms with some distinctive attributes in a niche market). Now it is recognized that firms may follow one of a number of idiosyncratic strategies (see Jauch and Glueck, 1988 for a review). And simply following a strategy is insufficient unless the firm has the resources, structure and setting to successfully implement it.

Strategy, Power, and Control

While much of the work on strategic choice can be collapsed into the systems view by using strategy rather than organizational goals to drive the analyses, another important causal mechanism can be identified in much of the research. Specifically, strategy research, by

placing the emphasis on senior management, also highlights the collective need by these individuals to control the system and increase their power (See Jauch and Glueck, 1988).

The need for power and control can be analyzed as an individual attribute (See Schermerhorn, Hunt, and Osborn, 1992). However, from a strategic standpoint, senior management must be concerned with three important facets of organizational life. One, there is a tendency for organizations to drift and merely replicate prior actions even when the environment has shifted. Two, there is a tendency for organizations to deteriorate over time if guidance is not provided. Three, there is a tendency for organizations to take advantage of each other or exploit one another. (See below under Transaction Cost Economics.) To counteract these tendencies, senior management, it is argued, should be vitally interested in (a) increasing its power to direct the system (b) keeping it attuned to its goals and its environment, and (c) monitoring relations with other organizations. Organizations are not democracies but hierarchies. The duties of senior management must be incorporated into a viable perspective of organizational design.

Transaction Cost Economics

Potential exploitation plays a central role in the transaction cost framework. While much of the work in the area has presented it as an efficiency requirement, it can be viewed in terms of executive choices to reduce the chances of being exploited.

In a transaction cost framework, firms are seen as choosing between markets and hierarchies in governing transactions (Williamson, 1975). Transaction costs are a function of the frequency with which transactions recur, the uncertainty to which they are subject, and the degree to which they are supported by durable and specific investments (Koenig & Thieart, 1988).

Firms will attempt to minimize transaction costs. They will transfer out those activities where the market provides for more efficient management while keeping those activities where the additional burdens of administration are offset by lower total transaction costs. For instance, in buying a unique product with high sunk costs (or fixed expenses), buyers may be concerned that sellers will act opportunistically by withholding key inputs and extracting a higher price. The seller might be concerned that the buyer may choose someone else, leaving them with substantial unrecovered sunk costs. With many buyers and sellers, there are alternatives for both that one should attempt to exploit the other. With few buyers or sellers, there is potential for exploitation, the risks escalate and, thus, the potential transaction costs are higher. To integrate the contributions of buyer and seller (where there are few of one or the other) within one hierarchy, could reduce costs.

Strategically, the firm should take high cost market transactions within its borders and administer them hierarchically. It should buy those products and services where the market mechanisms provide for lower transaction costs. The firm need not incorporate all functions

necessary to produce specific products or services but only those where administration within a hierarchy reduces transactions costs.

Theoretically, the structure of the firm should be designed to minimize transaction costs. While this prescription is consistent with the notion of the firm as a bundle of contracts, it tends to ignore the fact that organizations are composed of individuals, respond to the demands of numerous constituencies, and may not seek to minimize costs. Tests of the theory in regard to design, suggest that it has serious deficiencies. However, it has proven quite useful in studying alliances and the role of protecting against exploitation while benefiting from the work of others.

Strategy/Structure and Alliances. Transaction cost analyses may be applied in an inter-organizational context. When activities needed to produce a given product or service are "contracted out", the market may not provide all of the necessary control and coordination needed. Yet, it may be extremely costly to house all of these activities within a single hierarchy. Fortunately, there are a number of "alliance structures" that can provide additional control and coordination, and the governance of alliance structures becomes an added dimension to the overall design of the organization. An alliance between firms is simply an agreement to cooperate and coordinate activities. These alliances may be more or less formalized and may or may not be managed with a separate alliance structure (as in a joint venture).

Core Competencies and Network Relations. Examinations of alliance structures and network relationships among sets of related firms has started to introduce a new language into the analysis of organizational design. Two key concepts appear to have emerged from this literature (See Osborn and Baughn, 1990 for a review). The first concept focuses on the capabilities or competencies of the organization. What key contributions does the organization make that distinguish it from competitors? This notion of core competencies is now playing an important role in defining corporate strategy.

The second set of concepts is related to an expanded vision of design. Specifically, what "governance forms" are used to manage alliances and how is the firm positioned within a network structure? To date, the governance forms include agreements (such as original equipment supply and technical agreements), joint ventures (creation of a new entity to manage the relationship) and partial equity ownership of the alliance partners (see Osborn and Baughn, 1990, for a discussion). The analysis of network relationships is just beginning and no stable dimensions have yet to emerge from the literature.

A more complete review of strategic alliance and network relations is found in Chapter 5 since this was identified as one of four important change issues facing organizations in the 1990s.

SUMMARY

This chapter has reviewed work on three important mid-range theories that underlie much of the research in organizational analysis. To provide a somewhat different picture of these theories, they can be summarized in terms of different causal mechanisms.

The systems approaches to organizations essentially emphasize the rational aspects of organizational existence or the goal-directed aspects of organizations. Organizations are input-transformation-output mechanisms used to accomplish limited ends. As the discussion of additional variables suggests, however, they are populated by individuals and operate within a larger society. These two factors highlight two additional causal mechanisms.

Since organizations are systems partially composed of individuals, emergent aspects are important but often missing from systems views. Chapter VI will incorporate member enhancement as an important causal mechanism. The institutional view also suggests that societal conditions have a major effect on organizations at critical times in their existence. Organizations borrow solutions for other organizations and incorporate solutions even if they do not completely understand the causal mechanisms yielding success. This appears to be a major lesson of the ecological approaches.

Finally, we reviewed the notion of strategic choice. Underlying this literature is a very explicit role for senior management that places them in the center of critical organizational choices. Rather than merely act as rational goal-seeking agents that are the nominal head of an organization, this literature implies a slightly different role for these individuals. They must be concerned with power and control, not from an individual enhancement standpoint but from the needs of the organization if it is to remain viable. In Chapter VI, the analysis will incorporate this causal mechanism and note how it is possible for senior management to over-emphasize power and control to their benefit rather than to the benefit of the organization.

The transaction cost literature was used to show how the need to avoid exploitation in highly turbulent environments might well lead organizations to form alliances. Here the potential importance of core competencies and network relations were identified. This brief treatment set the stage for a more complete discussion in the next chapter on four key issues of change facing organizations in the 1990s.

CHAPTER V

SPECIAL ISSUES OF CONCERN IN ORGANIZATIONAL ANALYSIS

While each of the midrange theories provides an integrated, logically consistent view of organizations, several are often combined to study issues of concern to organizations. Managers are more interested in good solutions than elegant theories and the midrange theories often hit important boundaries in direct application in organizational settings.

INTRODUCTION

Many new issues arise in the literature each year. Some of these evolve into issues of continuing importance to both scholars and practioners simply because they alter the viability of organizations and/or how they operate within the modern administrative environment. While many issues can be discussed with reference to a singular midrange theory, some transcend current theorizing and begin to cross traditional disciplinary lines. In the 1970's and 1980's these issues included corporate social responsibility, the role of women in both managerial and executive positions, and the effects of changes in ownership (via mergers and acquisitions) among other topics.

A key distinguishing feature of the issues discussed in this chapter is the necessity to alter the emphasis on a single unit of analysis in order to incorporate multiple units of analysis within a singular topic. For example, systems theory emphasizes analysis of the firm and its components operating within an environment. Analyses of retrenchment often started within a system model but expanded to examine individual responses of executives, managers and workers (traditionally more a focus in organization behavior than in organization theory). Models of organizational learning from psychology, sociology and information sciences are often combined to study this issue.

In the judgment of the research team, four new important issues are having a dramatic impact on organizations in the 1990's. Retrenchment, innovation, organizational learning, and strategic alliances are the titles given to these. Each is important in its own right and each is not only altering organizational practice but organizational theorizing as well. While there are other important issues, these four have captured much attention in the organizations arena and appear to be four important change issues facing organizations in the 1990's.

OVERVIEW OF THE CHAPTER

This chapter has five sections in addition to the overview. Each section concerns one of the four change topics. The final section provides a brief summary. For each issue the analysis will begin with an overview followed by a brief section on definitions and classification. Since these issues are complex, the analysis will proceed with the dominant perspectives and note key concepts that have evolved from the literature.

Many organizations are facing retrenchment. They must shrink to survive in a more competitive environment. On the surface it would appear that retrenchment is the opposite of growth. Such is not the case. Effective downsizing calls for a more fundamental reexamination of the entire organization.

More rapid improvements in both administrative and technical methods are a reality of the 1990's. Those organizations that can effectively organize for change and adaptation are more likely to survive. While the necessity for change is not new, the accelerated pace of change and the more direct competition involving foreign firms places renewed emphasis on these issues. The literature on innovation and change challenges each of the midrange theories as it helps to predict and explain the types of improvement managers are instituting within their organizations across units of analysis.

At the same time organizations are retrenching and innovating, they are being asked to develop and institutionalize new skills and capabilities. In short they must learn. Organizational learning is a new requirement that again uses insight, theory and empirical results from a wide variety of disciplines.

Globalization is another new fact of life. And the basis of competition has expanded beyond a comparatively simple contest between firms producing similar products. Indirect competition among networks of organizations, where the networks cut across traditional national boundaries is now becoming commonplace. So, too, is indirect competition between different social sectors. These new indirect competitive pressures are yielding new organizational forms loosely called strategic alliances and organizational networks.

RETRENCHMENT

While several observers noted impending shortages and reductions during the 1970's, the field of organizational decline was not well established in the literature till the late 1980's (Cameron, Whetten, & Kim, 1987). In 1980, Whetten described an "emerging era of retrenchment", which was compelling organizations to substantially reduce their size and redefine their outputs in order to maintain their level of effectiveness (p. 581). Federal cut-backs, a stagnating worldwide economy, and taxpayer revolts have further directed attention to issues of retrenchment (Cameron & Zammuto, 1983).

The vast majority of the literature on decline has appeared within the past dozen years (Cameron et al., 1987; Cameron & Zammuto, 1983). This literature deals with the organizational consequences of decline, issues of work force reduction, and inter-organizational adjustments. As a whole, it clearly shows that retrenchment is not the opposite of growth. The dynamics of retrenchment, the outcomes of this process, and the reaction of individuals to retrenchment are quite unique.

Definition/Classification

One can distinguish between organizational decline, environmental decline, and organizational responses to decline (including downsizing). Organizational decline refers to a decrease in an organization's resource base over time (Cameron & Whetten, 1987a and 1987b; D'Aveni, 1989). It occurs when an organization either fails to maintain its level of adaptation to a stable environmental niche or fails to increase its domination of a contracting niche (Greenhalgh, Lawrence, & Sutton, 1988). Environmental decline is defined as a reduction in the size or qualitative nature (shape) of an organization's environmental niche (McKinley, 1987; Cameron & Zammuto, 1983).

Such decline has produced a wide variety of strategic and tactical responses (restructuring, downsizing, redeployment, industry exit) with varying degrees of success. During the 1990's it is expected that some organizations will continue to retrench as their role within the society diminishes. However, it is not preordained that a smaller system is necessarily less effective. It may be more successful on all other grounds than growth.

Dominant Perspectives

Several perspectives have been applied to this field including psychological, structural, resource dependency, institutional and inter-organizational approaches. These approaches are reflected in the following breakdown of the literature. One group of studies concerns the general organizational consequences of decline. A second group deals with managing decline to restore and/or preserve organizational success. Here, management is expected to play a much more active role. Unfortunately, comparatively few good studies of managed decline have yet been published.

A number of studies chart the organizational conditions associated with decline. First, it is important to recognize that decline is an alteration in size and scope but with consequences quite different from that for growth. The natural response to the threat of decline is rigidity by management. And there may be an imbalance in senior management from reductions in force. However, the precise nature of the decline also may produce different types of organizational responses.

Structure, Size and Technology Linkages. Logically, one might assume that if organizational growth increases needs for coordination and control and leads to more formalization (as presented in classic administrative theory), then declining organizational size should reverse the process. Organizations should naturally discard impersonal standardized procedures, for instance. Several empirical studies, however, demonstrate that structural change is not symmetrical during organizational growth and decline (see McKinley, 1987 and 1992 for reviews of this literature).

For example, several studies dealing with the effect of decline on organizational structure have concluded that the change in size of the administrative component during

decline is not simply the reverse of that obtained during growth. Freeman and Hannan (1975), for example, found that the number of administrators in school districts decreased more slowly in periods of declining enrollment than they had increased during periods of increasing enrollment. McKinley (1987) found that administrative intensity (the size of the administrative component relative to the rest of the organization's population) is less strongly related to technical and structural complexity in times of decline than under conditions of growth. That is, declining organizations have more difficulty than growing ones in appropriately altering administrative complexity.

In a study of electronics firms, Yasai-Ardekani (1989) did not find differential size-structure relationships as a function of environmental munificence-decline. His results also suggest that the relationships between a firm's core technology and its structure are moderated by environmental munificence and scarcity. His study suggested that there was movement to protect the organization's core during decline. The ability to change an existing technology depends, in part, on the degree of technological inflexibility (processes embodied in fixed-sequenced activities) involved. While technological inflexibility had no effect on organization structure in munificent environments, it had a substantial significant effect on structural complexity and formalization in scarce environments. Though this line of research yields some contradictory findings, it does suggest that research relating organizational structure to size and technology may need to incorporate the environmental (munificence or decline) context in which the organization is embedded.

Threat-Rigidity. Several researchers have suggested that decreasing internal resources may, among other things, generate a threat-rigidity response among managers of declining firms. This may include restricting some types of information processing, increasing formalization and centralization of authority, and conservation of resources with a strong emphasis on efficiency (D'Aveni, 1989; Sutton & D'Aunno, 1989; Staw, Sandelands, & Dutton, 1981). While such responses, when they occur, tend to lessen a firm's overhead costs in the short run, they are not necessarily adaptive in the long run (D'Aveni, 1989).

Strategies relying on prior knowledge and efficiency measures may serve to protect and stabilize the declining organization. (Cameron and Zammuto, 1983, refer to this as a domain defense strategy.) Unfortunately, a rigid response to do a better job with the existing strategy may not be appropriate. With decline, new and novel responses accompanied by a fundamental shift in resources may be required.

The threat-rigidity response documented by many researchers (see Yasai-Ardekani, 1989, for a further review) is postulated by Sutton and D'Aunno (1989) to be a general psychological response to work force reduction. They maintain that as the organization adapts to a smaller work force, less mechanistic means of coordination and control will eventually emerge, though the smaller firm will still be more centralized. McKinley (1992) however, suggests that the smaller firm will not necessarily adopt a less mechanistic structure over time, as mechanistic structures are often surrounded by a network of conditions that sustain that structure.

Cameron, Whetten, and Kim (1987), in a study of colleges, found several dysfunctions (resistance to change, curtailed innovation, scapegoating) associated with declining organizations. But they also found that such negative attributes are actually characteristic of both declining and stable firms. Only institutions with growing revenues appeared to avoid these dysfunctional organizational attributes. Smaller, privately controlled organizations appeared to be more vulnerable to these dysfunctions.

In sum, the threat-rigidity response may be organization-wide and there is no reason to believe that, absent managerial intervention, the organization will adopt an appropriate strategy or structure for the new environment.

External Resource Dependency and Legitimacy. Structural changes during decline may also reflect the needs of the organization and its senior managers to respond to specific important constituents and the general expectations of others. Two recent studies document these influences.

D'Aveni (1989) has suggested that organizations which have experienced decline may evidence an imbalance in the composition of their top-management teams. The imbalance may reflect the increased power of financial sources during periods of scarcity. Efficiency oriented firms may cut back in discretionary expenditures, and managers may cut back marketing and R&D, while emphasizing finance and legal functions in attempting to meet creditor demands. This proposition is consistent with a resource dependency model (Pfeffer and Salancik, 1978), and received some support in D'Aveni's (1989) study of firms filing for bankruptcy.

An institutionalization framework may be applied to conditions of decreasing financial resources and work force size. Beliefs and rules in the organizational environment may often influence organizational behavior more than internal technologies or the need to achieve goals (DiMaggio & Powell, 1983; Meyer & Rowan, 1977). The legitimacy acquired by conforming to widely held expectations may necessitate adoption of apparently inappropriate practices. For instance D'Aveni's (1989) study shows cuts in R&D. Several scholars suggest that theorists should study widely held beliefs about how organizations should respond to decreases in size (e.g., Sutton & D'Aunno, 1992).

Secondary Effects of Work Force Reduction

An emphasis on efficiency and cost cutting may involve downsizing--reducing organizational size and scope. Work force reduction has certainly been a common response to declining resources. Different methods of work force reduction generate different costs for organizations and employees. Much of the literature reflects a concern for the balance between providing as much support to existing employees and the financial realities of the organization (Bailey & Sherman, 1988; Bunning, 1990).

Several alternative methods of work force reduction have been enumerated. These include natural attrition, induced redeployment (including transfer to undersupplied jobs, optional part-time schedules, work-sharing arrangements, early retirement incentives, severance pay incentives for resignation) and layoffs (Greenhalgh, Lawrence, & Sutton, 1988).

While advantages and disadvantages of these methods have frequently appeared in the literature, the topic of layoffs has received the most attention. Direct and indirect costs of layoffs include increased unemployment insurance premiums, severance payments, legal fees, outplacement support, and the cost of training new employees when needed (Bailey & Sherman, 1988; Greenhalgh et al., 1988; Perry, 1986). Other cited indirect costs may include increased turnover among valued employees, absenteeism, declining commitment and loyalty, union grievances, unfavorable publicity, and loss of the company's best performers (Bunning, 1990; Greenhalgh et al., 1988; Hardy, 1987).

The downsizing literature also deals with effects on the employees themselves, including threats to both physical and mental health, subsequent unstable work histories (Greenhalgh, 1982; Greenhalgh et al., 1988), and survivors' reactions (Brockner, Grover, Reed, DeWitt, & O'Malley, 1987) as well as the process of disbanding during organizational demise (Sutton, 1987).

Brockner's stream of experimental and field observations indicates that workers who remain after a layoff react negatively when they identify with the workers who were laid off and perceive that those individuals have been inadequately compensated. Negative reactions may include reduced work performance and lower organizational commitment. Because of the organizational and personal costs cited above, most writers recommend that layoffs be considered as only one among a number of possible alternatives available to the organization.

In a most interesting observation made by Whetten (personal communication), he noted that the level of organizational productivity has often not been altered by substantial downsizing efforts. The downsized organization may only appear to be smaller. It may have curtailed internal operations only to substitute externally contracted inputs. A different type of mixed picture for individuals within downsizing organizations was also found by Koziowski et al (1991) in their review of the downsizing literature. For instance, they note that downsizing may substantially reduce the training opportunities for future executives and, thus, cut the potential future success of the firm.

Managing Organizational Decline

While there appear to be some natural responses by organizations to decline, as more and more organizations experience retrenchment it becomes increasingly obvious that some firms do a much better job than others. These differences have promoted two slightly different lines of research. One focus on appropriate responses to different types of decline while the other offers general recommendations for firms facing retrenchment.

Different types of decline. Cameron and Zammuto (1983) have presented a typology of decline phenomena as a step in identifying the most successful ways to manage it. The researchers suggest that four environmental decline conditions (erosion, contraction, dissolution, and collapse) influence the types of conflicts that organizations will face and managerial responses to the human resource issues presented. Their typology of environmental decline conditions reflects the continuous or discontinuous nature of the environmental change, and whether it reflects a change in niche size (reduction in resources, support, demand for output) or niche shape (changes in the type of organizational performance that the environment will support). The researchers note that such a typology holds potential for integrating and reconciling differing prescriptions for managing decline (also see Ferris, Schellenberg, & Zammuto, 1983). Suggestions for increased innovation and entrepreneurship may be appropriate in some conditions (dissolution, collapse), while defensive consolidation may fit other conditions (contraction).

D'Aveni (1989) has categorized declining firms based upon their longitudinal patterns of declining resources. He distinguishes between gradual decliners, sudden decliners, and lingerers, which may involve different consequences for the firms. Several other authors have offered less generalized models (e.g., Kozowski et al., 1991) tailored for more specialized purposes. Most of these include a consideration of the precise reasons for a reduction in size and the potential for changes in what the organization contributes.

Greenhalgh et al., (1988), present a model of the determinants of the type of work force reduction strategy actually employed (natural attrition, induced redeployment, involuntary redeployment, layoff with outplacement assistance, and layoff without outplacement assistance). The level of work force reduction strategy was postulated to be related to perceptions of the features of work force oversupply (magnitude, duration, and predictability), as well as such contextual variables as employee skill level (including external and internal demand for such skills), level of slack resources (as well as temporary employees to use as "buffers") and the nature of the organization (public agencies, publicly held private firms, unionized vs. non-union firms).

General Guidelines for Downsizing. A high proportion of the previously cited authors provide recommendations for avoiding some of the most obvious pitfalls in downsizing. The following five are representative of those found in the literature.

1. Assess the current organizational structure (reporting relationships, levels, spans of control) and the demands and constraints of the organization's environment. This recommendation for assessment may also include conducting a comparative analysis of other organizations.

2. Define the future organization. This involves clarifying organizational objectives and objectives of downsizing. Managers are to insure that the objectives of downsizing go beyond mere headcount reduction. Broader objectives might include faster decision making, quicker response to competitors' actions and lowered costs (including non-salary expenses).

Such objectives help to focus the downsizing plans and insure that they are consistent with the firm's strategic plan.

3. Determine an optimal structure supporting organizational objectives, and identify unnecessary positions. This recommendation appears quite common and appears to counter the natural response of managers to general expectations and/or the demands of newly powerful constituencies.

4. Analyze implementation prior to executing a downsizing program. This includes use of alternatives to terminations and placement opportunities as well as layoffs. Implementation issues address the speed of implementation (rapid work force reduction saves payroll costs, but may not give employees enough time to come to terms with their predicament; the trauma of severe work force reduction strategies is increased when the process continues over time), issues of who will be displaced, and how to retain quality people. Across-the-board percentage cuts maintain the perception of fairness, but may be seen as penalizing departments which are already so efficient that there are no surplus employees (Behn, 1987; Bunning, 1990; Greenhalgh et al., 1988). Disclosure is a frequently recommended aspect of the retrenchment process. Managers are advised to openly explain problems (Behn, 1987; Bunning, 1990; Greenhalgh et al., 1988; Hardy, 1987). Restructured firms must draft new job specifications, standards of performance, and compensation packages.

5. Install a follow-up system to assess the extent to which the structural goals are being met (See Appelbaum, Simpson, & Shapiro, 1987; Cody, Hegeman, & Shanks, 1987; Heenan, 1989; Nienstedt, 1989; Tomasko, 1988 for guidelines).

Inter-Organizational Adjustments. Organizational decline may effect inter-organizational agreements and organizational network configuration. (Whetten, 1980). Resource scarcity may encourage organizations to establish joint ventures to pool their resources for funding new programs (Cummings, Blumenthal, & Greiner, 1983; Hage & Aiken, 1967). However, empirical studies dating to the 1970's (e.g. Osborn and Hunt, 1974) suggest just the opposite. Environmental turbulence rather than decline appears more centrally related to the formation of alliances.

A potentially rich highly uncertain environment appears to yield more new alliances than a predictable declining environment. This is consistent with resource dependence theory (Aldrich & Pfeffer, 1976; Pfeffer & Salancik, 1978). Organizations are expected to deal with uncertainty regarding critical environmental resources through such actions as mergers, joint ventures, and interlocking directorates. However, whether the reconstitution of the organization will proceed under conditions of scarcity and unpredictability is unknown.

Summary and Future Retrenchment Research Needs

The literature on the effects of decline and scarcity has grown rapidly, with researchers examining several psychological, strategic and structural responses. As D'Aveni (1989) has noted, most studies of the consequences of decline have been theoretical summaries or case-oriented reports. Downsizing articles are quite common in practitioner journals, and generally consist of guidelines, recommendations, and warnings.

This field is moving toward more empirical, data-based studies. Under the rubric of organizational decline, studies are needed to track the influence of decline on organizational reactions. Inconsistencies in current studies suggest that the nature of the decline (Cameron and Zammuto, 1983), the positioning of the firm prior to the decline (D'Aveni, 1989), and the type of firm need to be taken into account in predicting macro-level structural responses. Prescriptive conclusions can rarely be drawn from the existing empirical studies, as such studies do not track the effect (if any) of organizational reactions on subsequent firm improvement.

Empirical human resource related studies have included delineation of characteristics of those who accept early retirement offers (Howard, 1988), as well as personnel responses to downsizing (Brockner et al, 1987; Greenhalgh et al., 1988). Again, longitudinal studies delineating the effect of such reactions on organizational turnaround or continued decline would be desirable.

Many more criterion-specific studies are needed. To the extent that interventions (such as downsizing) in the face of declining resources entail alteration in specific organizational objectives, the impact of such interventions on these objectives needs to be more fully addressed. Heenan (1990), for example, notes that while downsizing has often been used to improve the flow of information throughout the firm, this has not necessarily followed. Organizational streamlining may be seen as a way of reducing the number of information filters and the fragmenting of responsibility. However, Heenan (1990) notes that such "filters" may serve as a desirable form of information processing and uncertainty reduction.

The role of alternative sources of information processing and task accomplishment may also warrant further study. To what extent, for example, can information technologies play a role in downsizing? In what cases are such technologies an adequate (or inadequate) substitute for personnel? Are the many recent examples of reductions in middle management traceable to prior improvements in information systems?

On a broader level, analyses of downsizing needs to be integrated with existing midrange theories and studied in combination with organizational learning, innovation, and the evolution of organizational alliances.

ORGANIZATIONAL LEARNING

A common theme in recent management literature involves organizations' abilities to learn and adapt, and the importance of such learning on organizational survival (Fiol & Lyles, 1985). Organizational change can be modeled as an experiential learning process (March & Simon, 1958; Cyert & March, 1963; March and Olsen, 1976; Argyris & Schon, 1978). While there exists widespread acceptance of the importance of organizational learning to strategic performance, no single theory or model of organizational learning is widely accepted (Fiol & Lyles, 1985). The literature in this area largely consists of attempts to define organizational learning, differentiate among aspects of the phenomenon, and describe the successes and failures firms encounter in learning. As Dodgson (1991) has observed, learning is a multi-faceted and complex concept, and this needs to be taken into account.

Organizational learning is based on issues relating to knowledge acquisition, information distribution, information interpretation, and organizational memory. Studies dealing with one or more of these key components have delineated organizational learning problems and implications for organizational design facilitating organizational learning. With the exception of research on experience-based learning curves, however, formal systematic field studies are rare.

Definitions and Key Constructs

Huber (1991) maintains that an entity learns if, through its processing of information, the range of its potential behaviors is changed. Learning occurs as units of organizations acquire and diffuse knowledge recognized as potentially useful. Organizational learning addresses how knowledge is acquired, conserved, lost and invoked.

Organizations are seen as learning by encoding inferences from their history into routines that guide behavior. Such routines include rules, procedures, conventions, strategies, codes, cultures, frameworks, beliefs, and technologies around which organizations are constructed and through which they operate (Levitt & March, 1988). Organizational actions are a function of matching procedures to situations. Learning is seen as history dependent in that experiential lessons of history are captured by routines in a way that makes the lessons accessible to organizations and members who have not themselves experienced the history. Such learning is transmitted by socialization. Organizational routines need not remain fixed, but may be transformed as well (Levitt & March, 1988).

Learning in organizations is a social phenomenon (Simon, 1991). As Simon (1991) notes, what the "organization" knows is a function not only of what individual decision makers know, but the relationships (such as communication and command channels) between these decision makers. Though individual learning is important to organizations, organizational learning is not simply the sum of each member's learning. Organizations develop and maintain learning systems that not only influence their immediate members, but are then transmitted to others within the firm (Fiol & Lyles, 1985).

Together, organizational innovation (the adoption of a new idea) and organizational learning (the capability to behave differently) constitute two of the most important change processes in organizations. Of the two, organizational learning is by far the newer and less well explored area.

Classifications and Key Constructs

Huber (1991) notes four major constructs related to organizational learning. These are (1) knowledge acquisition, (2) information distribution, (3) information interpretation, and (4) organizational memory. Each of these is discussed in detail to help organize the literature.

Knowledge Acquisition. Knowledge may be acquired within the organization at any time during its existence. However, researchers suggest that the type of information encoded and the lasting effects of knowledge acquisition may differ substantially during formation versus on-going experience. Vicarious learning may occur as the organization seeks to improve its performance.

- Formation. Stinchcombe (1965) notes that knowledge about the environment and processes may be incorporated by organizations at the time of founding. The knowledge absorbed at this time is particularly important since it provides a foundation for all subsequent learning processes. Particularly at the time of founding, organizations pervasively imitate other organizations because doing so minimizes sanctions from a variety of stakeholders (e.g. Meyer and Rowan, 1977; Zucker, 1987). Mimicry occurs particularly when technologies are poorly understood and when goals are ambiguous. Yet, imitation often is not always viable, as it implies both waiting and jumping into an occupied niche (Eisenhardt, 1988).

The mimicry established at the time of founding may continue as firms attempt to copy the practices of key industry leaders (DiMaggio and Powell, 1983). Key firms, or industry leaders, establish legitimized characteristics. Others monitor the behavior of industry leaders and change in order to become more like these firms, and thus more legitimized. Organizations with this pattern of search behavior follow an imitative strategy (Lant & Mezias, 1990).

It is quite possible for a firm to mimic others and not attempt to understand cause-effect relationships specific to itself. Further, once established at the time of founding, mimicked behavior may be given meaning within the organization and elevated to the status of a founding mythology (see Schermerhorn, Hunt and Osborn, 1992). Thus, it is not unusual to find authors suggesting that firms needed to "unlearn" to learn (e.g. Dodgson, 1991).

- Experience. Knowledge is also acquired through direct experience. This includes learning-by-doing, leading to experience-based learning curves. Learning-by-doing, for example, has been widely used among economists in explaining how manufacturing unit costs decline over time or with experience. Experiential learning also includes R&D,

test-marketing, self-appraisal, and unintentional learning (Huber, 1991). The key to experience-based learning for organizations appears to involve a number of strategic, managerial, and structural conditions within the firm that facilitate cause-effect dialogue and examination.

Japanese organizations are well known for a number of techniques that promote experience-based learning based on systematic feedback. Various methods (including statistical quality control, quality circles and the like) are used to identify, probe and improve operations.

- Vicarious Learning. Organizations attempt to acquire new knowledge in a variety of ways. Among these are scanning, grafting, and contracting out.

- Scanning. Following formation, learning may involve scanning the environment for change. This search is triggered by performance gaps and departures from aspiration level (Cyert & March, 1963; Lant & Mezias, 1990). Scanning focuses on boundary-spanning personnel as sensors of the organization's environment. When the expertise of most internal users of outside information differs considerably from that of external agents who can provide useful information, some individuals are likely to assume relatively centralized gatekeeping, or boundary-spanning roles. The gatekeeper monitors and translates technical information to a form usable to internal users (Cohen & Levinthal, 1990). Gatekeeper characteristics may influence the ability of the organization to acquire information (Huber, 1991).

- Grafting. As noted by Huber, (1991), acquisitions of individuals and organizations (as with GM's acquisition of EDS to obtain information systems expertise) may be used to possess knowledge needed by the organization. Pucik's (1988) examination of knowledge acquisition through joint ventures delineates components of carefully planned and executed organizational learning exemplified in Japanese joint ventures. The transfer of know-how from the partnership to the rest of the organization is supported and guided by a "learning infrastructure" with a high priority on learning activities, personnel exchange, career structures and rewards conducive to learning.

- Contracting Out. To investigate areas where the organization has comparatively little knowledge or where it wants an independent analysis, many organizations contract out knowledge acquisition for specific areas. The large consulting business serving U.S. firms is testimony to the importance of the acquisition method.

Information Interpretation. Organizations are generally expected to develop a collective understanding of their history. These interpretations depend on frames within which events are comprehended (Daft & Weick, 1984). Organizational interpretations are often resistant to experience. They are often sustained and conserved in face of considerable potential disconfirmation (see Osborn and Jackson, 1988, for a discussion).

The rate and acceptance of new information, according to the organization learning framework, depends on the degree to which it conflicts with existing paradigms and the politics within the organization (Nonaka & Johansson, 1985). Organizational change may therefore require redefinition of events, paradigm shifts, or "double-loop" learning (learning within a new frame of reference, re-examination of governing policies or values rather than simple matching of routines) (Argyris & Schon, 1978).

Organizational Memory. Learning may be embodied in workers and in the organization. Lessons of experience are maintained and accumulated within routines, despite the turnover of personnel and the passage of time. Such rules, procedures, technologies, beliefs and cultures are conserved through systems of socialization and control. Mechanisms of organizational memory include documents, rule books, professional standards, organizational structures, stories, and the shared perceptions of "the way things are done around here".

Walsh and Ungson (1991) delineate six retention facilities of organizational memory, including individuals, culture, transformations (logic incorporated in such work practices as market planning, work design, and selection procedures), structures, ecology (the physical structure) and external archives (including former employees, data tracking firms, and the news media).

Experiential knowledge may be in tacit form or in formal rules. Organizations vary in emphasis placed on formal routines, as noted earlier in the discussion of bottom-up views of structure. Organizations facing complex uncertainties often rely on informally shared understandings more than do organizations dealing with simpler, more stable environments (e.g., Osborn et al, 1980).

To the extent that organizational memory relies on individual memory, it is eroded through turnover (Simon, 1991). Walsh and Ungson (1991) posit that organizations having a long and stable history of tenured individuals will have a higher capacity to acquire, retain, and retrieve decision information relative to other organizations.

Organizational memory may be computer-based as well. Continual increases in the accessibility and capacity of computer-based information retrieval systems have lowered obstacles to information storage and retrieval, and can be embodied in automated expert systems (Simon, 1991).

Retrieval. The availability of information in organizational memory is associated with frequency of use of a routine, recency of use, and organizational proximity, as well as the direct costs of finding and using what is stored in memory. Modern information technology, as noted above, has reduced those costs. Such automation makes retrieval more reliable, but it is a mixed blessing. Standardization of retrieval may reduce experimentation. Further, one must be aware of the political or other contexts within which prior solutions were deemed appropriate.

Diffusion. The issue of diffusion of learning in organizations has focused predominantly on research in organizational behavior and organizational communications. How information is diffused within the organization has been found to be a function of past routing, costs, power and status of the sender and receiver, rewards and penalties involved, and workload (Pavitt, 1990). Such diffusion must also take into account proximity, geographical location, especially where the task to which such knowledge is applied is loosely structured, requiring personal contact and discussion (Pavitt, 1990). While Huber (1991) provides several propositions regarding how information is distributed within organizations, very little of the literature has been tied into that concerning the diffusion of innovations.

As Cohen and Levinthal (1990) note, it has been generally accepted that complementary functions within organizations ought to be tightly intermeshed, creating cross-functional absorptive capacities. Examples include the need for close linkages between design and manufacturing. Clark and Starkey (1988), for example, argue that the speed of product development is strongly influenced by the presence of such linkages as direct personal contacts across function, liaison roles at each unit, cross-functional task forces and cross-functional project teams. Job rotation may also provide a linkage of areas and knowledge domains. In fact, the job rotation programs, consensus decision process, and wide sharing of information utilized in Japanese organizations are seen as facilitating dispersal of information throughout the firm, enhancing organizational learning (Nonaka & Johansson, 1985).

Several researchers have also studied how information and learning is diffused between organizations. Such diffusion may be classified as coercive, mimetic, or normative. Coercive diffusion involves transmission of information from a single source, often a source upon which other organizations are dependent (governmental agencies, trade associations, professional associations, unions). Mimetic processes involve direct and indirect contact between organizations (organizational contacts, consultants, movement of personnel). Normative processes involve small group contagion to a larger population (educational institutions, experts, trade and popular publications (DiMaggio & Powell, 1983; in Levitt & March, 1988). More recent work also suggests that indirect diffusion through products, reverse engineering, and technical standards may be a fourth important mechanism (See Baughn and Osborn, in press).

Dominant Perspectives

As noted previously, no single theory or model of organizational learning is widely accepted (Fiol & Lyles, 1985). The literature in this area largely consists of attempts to define organizational learning, differentiate among aspects of the phenomenon, and describe the successes and failures firms encounter in learning.

Learning Problems. Organizations may fail to acquire needed information for a variety of reasons. There may be a shared sense of over-confidence (hubris), an unwillingness to engage in expensive search routines, or misattributions of cause-effect relationships. There

may also be problems with sensors of experience or problematic information routing with the firm. Another common barrier to learning involves competency traps.

Organizations often have problems in overcoming the competencies developed with earlier procedures. Favorable performance with an inferior procedure may lead the organization to accumulate more experience with it. This leads to maladaptive specialization (Levitt & March, 1988). Several researchers have therefore stressed the importance of "unlearning" in facilitating organizational adaptation (see Dodgson, 1991).

Learning is inhibited in organizations through avoiding public inquiry regarding assumptions. Such avoidance may reflect attempts at protectiveness, task control, or fear of invoking negative feelings (Argyris & Schon, 1978). Error detection and correction is thereby made unlikely.

Lounamaa and March (1987) suggest that experience may be a poor teacher when the relation between the actions of individuals in the organization and overall organizational performance is confounded by the simultaneous learning of other actors and by errors in perceiving performance. If organizational adjustments are made too frequently, they are based on observations that are too unreliable. Learning is confused by trying to associate an outcome with any one of several simultaneous changes.

Implications for Organization Structure. Stinchcombe (1990) holds that the variety of organizational forms we see about us are the product of the seeking and processing of information about the organization's key uncertainties. In effect, organizational structure is viewed as a design for organizational learning, for acquiring information about the state of the world and for improving what the organization can do. Organizational arrangements will be designed to acquire, as quickly and as reliably as possible, the information needed to improve the speed of routines and change their contents, and to switch accurately among existing routines, as these are major sources of competitive advantage (Cohen, 1991, Stinchcombe, 1990).

Understanding the sources of a firm's learning capacity includes a focus on the structure of communication between the external environment and the organization, as well as among the subunits of the organization, and also on the character and distribution of expertise within the organization (Cohen & Levinthal, 1990).

A key issue in the area of organizational learning involves attempting to identify properties of interacting organizations that lead some of them to learn and others not to do so. Powerful organizations, by virtue of their ability to ignore competition, may be less inclined to learn from experience and less competent at doing so. Some observers charge that a powerful organization will become incapable of coping with an environment that cannot be arbitrarily enacted (Hannan & Freeman, 1984).

A review by Fiol & Lyles (1985) suggests that four contextual factors affect the probability that learning will occur: a corporate culture conducive to learning, strategy that allows flexibility, organizational structures that allow both innovativeness and new insights (a centralized mechanistic structure tends to reinforce past behaviors, whereas an organic, more decentralized structure tends to allow shifts of beliefs and actions) and the environment (moderate levels of turbulence and complexity). According to the review by Fiol and Lyles (1985), learning is enhanced by structures that diffuse decision influence.

Structural Recommendations. Bushe & Shani (1991) describe the benefits and deficits of [mechanistic] bureaucratic characteristics of organizations (centralized control, task specialization, functional grouping, internal standardization) as they apply to problems of learning and adaptation. They recommend developing supplemental structures ("parallel learning structures") in [these] bureaucracies to allow for both efficiency and innovation. Such structures generally involve a steering committee and a number of small groups consisting of organizational members, whose relationships are not limited by the formal chain of command.

Meyers (1990) associates organizational learning with such changes in organizational design as venture teams, innovation task forces, participative, open management approaches, and the development of a clear and consensual statement regarding the organization's mission. She suggests that the types of innovation and learning modes need to be consistent with the phase of the technology life cycle (initiation, rapid growth, maturity, crisis, renewal) facing the firm.

Sullivan and Nonaka (1986) maintain that the role of senior managers is to foster variety in ideas (encouraging varied interests and points of views, providing wide exposure of managers to the organizations environment, and initially processing data in an unstructured, equivocal manner). The resulting uncertainty will then be reduced to more certain knowledge by lower-level managers.

Other writers invoking an organizational learning framework state that a major objective of structuring top management tasks is to facilitate consensual understanding of strategic problems by promoting interpersonal trust and understanding among key decision makers. A second objective of structuring is to allow smooth flow and effective sharing of strategic information. Third objective is to reduce distance between strategic decisions and the operational base of problems (Shrivastava, 1986).

Stana (1990a) emphasizes the development of a shared information network within organizations, enabling companies to quickly retrieve internal information and disseminate external information. Stana (1990b) discusses data base management and the development of an integrated electronic (computer) and hard copy network to address the information needs of the organization.

Learning Cycles. Following comparatively new work in innovation, it would appear that different aspects of structure might well be needed to facilitate different stages of

organizational learning. While the less bureaucratic structures mentioned in the learning literature might well improve the chances of knowledge acquisition and promote a variety of interpretations, they may be ill-suited for memory retention.

Initial empirical work on learning in organizations operating commercial nuclear power plants suggests that organizations appear to move through benefit cycles and destructive cycles. That is, some organizations appear to be able to take effective corrective action and initiate a benefit cycle where a singular error is followed by a long period of improvement. Conversely, some organizations make a mistake and appear to compound the error in attempt to fix the original problem. Work by Marcus and his colleagues (see Osborn and Jackson, 1988, for a review) suggests that a complex array of resource, structure, top management support and technical competence variables have a profound effect on whether the organization moves into a benefit or destructive cycle.

Learning Curves

The measurement of organizational learning appears to be most mature in its depiction of learning curves. Research in aircraft production prior to and during WWII (see March, 1991) indicated that direct labor costs in producing airframes declined with the cumulative number of airframes produced. Attempts have been made to decompose curves into intercorrelated causes and assess separate contributions to observed improvement in manufacturing costs, including feedback from customers, and direct effects of cumulative experience on production skills (Levitt & March, 1988). One can describe the change in rate of learning as knowledge stock grows (or declines). Learning curves have recently been used to model intra-plant transfer of knowledge (Levitt and March, 1988).

Learning curves may also be used to plot quality improvements over time (such as reduction in defects, percentage of orders shipped late). The slope of the learning curve is determined by how long it takes to identify and prioritize causes of a problem and to eliminate those causes (Stana, 1990a). Predictions from such mathematical models have frequently been used in planning (Huber, 1991).

Cohen & Levinthal (1989, 1990) argue that in addition to generating innovations, a firm's research and development efforts also enhance the firm's ability to identify, assimilate, and exploit knowledge from the environment. That is, internal R&D also enhances the "absorptive capacity" of the firm. The researchers developed a mathematical model incorporating absorptive capacity with other critical variables (technological opportunity, appropriability). Absorptive capacity may be created as a byproduct of a firm's R&D investment (as well as of a firm's production experience).

March (1991) presents a model of socialization (including rates at which individuals come to adopt organizational codes, heterogeneity of learning rates, and turnover) relating to improvement in organizational knowledge. His study demonstrates the tradeoff between exploration of new possibilities (experimentation, innovation, variation) and exploitation of

old certainties (March, 1991). The tradeoff between exploration and exploitation involves conflicts between gains to individual knowledge and gains to collective knowledge.

Research Issues in Organizational Learning

Except for literature on experience-based learning curves, the literature on organizational learning from experience contains very few formal, systematic field studies. Much work on knowledge acquisition is non-cumulative--that is, it fails to build on other research. Research on the diffusion of knowledge within organizations is extensive, incorporating research in both organizational communication and organizational development. Unfortunately, this research is not integrated with that concerning the diffusion of innovations.

Empirical studies of fundamental changes in organizational frames of reference have been limited primarily to case studies (Huber 1991). Schon (1983), and Argyris & Schon (1978) have attempted to characterize organizational learning by operationalizations distinguishing organizational from individual learning (repetitive use of a procedure, its prevalence of use in the organization, whether it was incorporated in procedures for decision and control, whether socialization of new members included this practice, etc.). They suggested investigating signs of interpersonal and organizational quality in learning. They are particularly interested in the treatment of information (are assertions testable?), integration of information by members into a single model, the extent to which the coupling advocacy of member's own position with inquiry into the position of others alters information acquisition, interpretation, and memory.

As noted previously, several investigators have presented characteristics of learning organizations based on their observations (Nonaka, 1988; Pucik, 1988). These need to be linked to the literature on innovation and empirically examined.

There is a need to study organizational "maps" to uncover how features of a system have been placed in a pattern which illuminates the informational interdependence among the parts of the organizational system (Argyris & Schon 1978, p.160). Consistent with this line of inquiry is Huber's (1991) observation that we need to know how organizational units possessing information and units needing this information can find each other quickly. This may be a key to understanding learning cycles of organizations.

Above all, the issue of organizational learning needs to be studied within a number of midrange theoretical perspectives and in conjunction with innovation to ascertain when, where, why and how knowledge is acquired, interpreted and kept in effective memory. For instance, such work could easily build on information systems to help integrate the individual bias in current work with the systems bias in studies of information systems (G. Huber, personal communication).

INNOVATION

Since Schumpeter (1934, 1942) stressed the central importance of innovation in (a) the dynamic competition among firms, (b) the evolution of industrial structures, and (c) the processes of economic development, scholars have studied when, where, how and if organizations can or will adopt new products, procedures and administrative practices.

Studies of innovation attempt to examine the dynamics of change and adaptation. With more rapid increases in rate of technological and administrative change occurring on a broad scale in both the public and private sectors, the study of innovation has received more attention in recent years. It is an area where the ideas of sociologists, technologists, economists, psychologists and organization theorists intermingle freely.

Following Schumpeter, innovation studies include analyses of new products and production processes, new forms of organization, new markets, and new sources of raw materials. In more recent years an impressive amount of research has attempted to explain the adoption of innovation within organizations and the diffusion of innovations among organizations. Distinctions have been made between types of innovation (e.g., technical, administrative) and magnitude of change (radical, incremental). Once confined to a single organization, new work is linking organizational and environmental characteristics to innovation in analyses of complex networks and alliances. This aspect of innovation is discussed under the topic strategic alliances.

While there are many ways to study innovation, three major approaches appear particularly important. One, technoeconomic perspectives link external market conditions and internal manufacturing processes to innovation rates. Here the emphasis is on technological and administrative pulls on the firm to change. Two, strategic perspectives delineate the organizational and technological strategies firms should adopt and plot the resulting levels of innovation. Some analyses in this approach emphasize technological/administrative pushes toward innovation. Third, structural approaches link innovative success to organizational integrative devices, specialization, alignment of the strategic apex with the technical core, decoupling of units, and structural reconfiguration. Here it is often assumed that both push and pull factors are present but may be capitalized on by some organizations more than others.

Definitions and Overview

Innovation is often defined as the adoption of an idea, whether pertaining to a device, system, process, policy, program, product or service that is new to the adopting system. While a number of researchers have suggested that differences in types of innovation may preclude the development of a unitary theory of innovation (see Fennell, 1984), various specialized approaches have demonstrated considerable empirical support. This review recognizes that innovation is a complex construct. A wide variety of individual, organization and contextual factors affect adoption of an idea (e.g., Damanpour, Szabat, & Evan, 1989 and

Fennell, 1984). Further, mere adoption of an idea is only the beginning of the innovation process that may or may not lead to higher systems performance.

Administrative Versus Technical Innovations. A distinction is frequently made in the literature between technical and administrative innovations. Administrative innovations affect the social system of an organization. The social system includes rules, roles, procedures, and structures that are related to the communication and exchange among organizational members, and between the environment and organizational members. Administrative innovations may include changes to an organization's structure and processes. Administrative innovations may indirectly influence the introduction of technical (product process) or service innovations (see review by Damanpour et al., 1989). Technological innovations typically include alterations in the transformation process via new inputs, methods of converting inputs to outputs, and outputs (both products and services).

As Robey (1991) notes, classifying innovations into categories is difficult because many innovations have characteristics of more than one category--there is often a close interdependence among technical and administrative innovations. Both are often needed if the organization is to change successfully. Damanpour and Evan (1984), for example, compared the rate of adoption of both technical and administrative innovations in public libraries. They found that technical innovations were adopted at a faster rate than administrative innovations, and that the greater the discrepancy between the rate at which new technical and administrative ideas were implemented in the organizations ("organizational lag"), the poorer the organization's performance. Further, they found that the adoption of administrative innovations tends to trigger the adoption of technical innovations more readily than the reverse.

Incremental Versus Radical Innovations. Another major distinction in innovation type differentiates incremental from radical innovations. Incremental innovations involve the refinement and improvement of an existing design and/or system. They have frequently been seen as supporting the dominance of existing firms, as they may build on core competencies (e.g., Abernathy & Clark, 1986, Tushman & Anderson, 1986). Radical innovations involve the adoption of a new idea that displaces another. Radical innovations may create great difficulties for existing firms, allow the successful entry of new firms, or even redefine an industry.

Recent research on the importance of incremental advances has helped to balance Schumpeter's stress on radical innovations creating "gales of creative destruction" (Tushman & Nelson, 1990). Henderson & Clark (1990) have refined the simple polar distinction between radical and incremental innovation by noting that innovations may change core design concepts (involving change in the basic knowledge underlying the components) and/or the way in which the components of a product are linked together. They thereby define four types of innovation-- (1) radical innovation, in which both core concepts and component linkages are changed, (2) architectural innovation, involving a change in component linkage

but no change in core concepts, (3) modular innovation, overturning core concepts, but leaving linkages unchanged, and (4) incremental, involving little change in either system.

Different types of innovation appear to call for different subsequent changes for successful change. Henderson & Clark (1990) maintain that formal and informal organizational communication channels are built around the organization's architectural knowledge of component linkages. Based on the organization's understanding of effective architectural design, it develops information filters that allow it to identify what is most crucial in its information stream as well as strategy routines for recurring problems. For existing firms, architectural innovation may require changing embedded channels, filters, and strategies. In a two-year, field-based study of the photolithographic alignment equipment (used to manufacture semi-conductors) industry, the researchers found that reliance on architectural knowledge blinded firms to critical aspects of next-generation technology, despite heavy investment in the new technology.

Systems Views of Innovation. One problem in separating administrative from technical and/or incremental from radical innovations is a focus on the existing system. Too many analyses concentrate on a single firm or treat the firm as possessing a single unified structure. Recent work has attempted to circumvent this limitation. For instance, Stinchcombe (1990) identified six elements in describing the social requirements for innovation, extending the scope of theorizing beyond the organization itself.

Stinchcombe's six elements attempt to capture those individuals, firms, and constituencies attached to requirements for the successful adoption of a new idea. His analysis attempts to link elements in the process of turning an invention into an innovation. He notes, for instance, the necessity of creating new information-processing and decision-making routines to link important elements. He includes the technical theory of the innovation and the group that develops and defends this theory. He notes the importance of investment and the corresponding investment group. Then the technical costs/benefits are matched to the corresponding engineering or technical groups controlling costs and receiving benefits. A fourth factor involves the market and the benefits to the market while a fifth factor focuses on the division of benefits. Finally, he analyzes the affected personnel.

Van de Ven and his colleagues (e.g., Van de Ven, Angle and Pool, 1986) offer another systems perspective that goes beyond the boundaries of the firm. These analyses of innovations involve not only the receptivity of the firm to adopting a new idea but also the larger institutional setting that supports or does not support adoption.

Dominant Perspectives Involving Organizational Factors

Since the innovation literature is so large and complex, the remainder of the review will focus on those elements of the literature that include organizational factors. A large body of research on individual considerations in innovation as well as economic analyses of innovation rates are, therefore, excluded.

Collins et al., (1988) notes two dominant perspectives on how characteristics of organizations are involved in innovation: the structural and the technoeconomic. According to both the structural and the technoeconomic perspectives on innovation, differences in the extent of a firm's innovativeness are partly a function of (1) external incentives for change, such as changes in product demand (or technological/administrative pull from the market), (2) internal mechanisms like technical experts who help firms identify problems/opportunities and provide solutions to problems/opportunities (or technological/administrative push), and (3) internal mechanisms that enable change is necessary, such as low formalization or flexible manufacturing technologies (or technological/administrative facilitation).

Because the proposed view of organizational design incorporates strategic considerations, this review incorporates strategic aspects of innovation as well. The strategic approach helps link the technoeconomic and structural approaches.

Technoeconomic Perspectives: Context and Characteristics of Innovative Activities. Researchers taking the technoeconomic perspective have primarily been concerned with how the juncture of internal manufacturing process and external market factors affect the type (e.g., product vs. process) and rate of innovations within firms.

The technoeconomic perspective examines how characteristics of production technologies themselves (including physical process, method, and equipment) affect organizational capacity and the potential for subsequent technological change. Most investigations adopting this perspective have assumed that changes in an organization's dominant markets, such as changes in a product's life cycle or in number of competitors, externally determine the desire to adopt process innovations. Extant technological attributes also affect the manner and degree to which managers can respond to market pulls and technological push because of such factors as fixed costs and technical feasibility (Collins et al, 1988).

The Natural Process of Innovation. The most widely cited model of a natural process of technologically based innovation is Utterback and Abernathy's (1975) model of product and process change in strategic business units. The three key factors explaining this dynamic model of innovation are market demand, production technology characteristics, and a firm's strategy for competition and growth.

In this model, the rates of process and product innovation follow distinct curvilinear patterns over time (see Collins, Hage, and Hull, 1988). Building on this model, Henderson and Clark (1990) note that the initial period of turbulence is naturally followed by technological continuity. Initially, rival technical variants vie for dominance and one begins to dominate. Organizations switch attention from learning a little about many different possible designs to learning a great deal about the dominant design. As the technology matures, knowledge becomes embedded in the practices and procedures of the organizations (Henderson & Clark, 1990). The process is repeated when a new technology displaces the old.

In support of this view, Sahal (1981) noted increasing production certainty as products mature and become familiar to most users. As an organization gains experience with given technology, it realizes how to further improve it. Over time, the scale of the firm's production system increases, which in turn increases its operational complexity. To cope with problems of complexity, the organization adopts more and newer technologies. Once the production system becomes excessively large in scale and operationally complex, however, further technological change is thwarted. As Abernathy et al., have suggested, firms may need to "de-mature" to remain competitive or they become vulnerable to more flexible competitors (see Child, 1987).

Some other studies have supported some of the basic theses of the techno-economic perspective when applied to the strategic business unit level of analysis. However its applicability is limited at the industry level (see Collins, Hage, and Hull, 1988). And it is particularly vague about the length of the innovation cycle, the factors involved in separating winners from losers, and the choices managers may make to alter their firm's competitiveness. Essentially, it is a good retrospective explanation for innovative actions.

Discontinuities and Innovation. Focusing on the events which trigger the technological and product/cycle discontinuities, Tushman and Anderson (1986) showed that competitive conditions after a technological breakthrough are often sharply different from those that prevailed before the discontinuity. Increasing levels of technical and market uncertainty, changing terms and sources of competition, and new strategic options and choices are common. Dramatic shifts in industry structures and competitive positions can follow as the traditional advantages of established firms are eroded. New firms and other new entrants play important roles as their exploitation of scientific and technical advances overcomes or circumvents traditional entry barriers (see Hamilton, 1990, for a review).

As Pavitt (1990) found in his study of the British electronics industry, the presumed negative effect of technological discontinuities on larger firms may be mitigated by the resources available to such firms. Pavitt's study found that innovation made by both large and small firms have been made at the expense of the medium sized firms. Large firms may have specialized and professionalized R&D laboratories and other technical functions with accumulated skills and experience in integrating inputs from a wide variety of disciplines. They may be able to hire and integrate professionals from promising new areas. Large firms may also have considerable oligopolistic power, and have the time and resources to explore and link technological discontinuities with core competencies within the firm (Pavitt, 1990).

Innovation and Technological Strategies. While the innovative opportunities open to a firm are strongly conditioned by a firm's size and by the firm's core business (Pavitt, 1990), organizational strategies also set the context in which innovations occur (Shrivastava & Souder, 1987). The strategy that the firm adopts has a direct influence on resource allocations for innovation projects and capital investment decisions to commercialize new products/processes/ Implicit in strategies are the technological objectives of the organizations, which direct the choice of R&D projects, their priorities and the organizational

commitments to individual projects. Technological objectives are in effect a part of the overall diversification plan of the firm (Burgelman & Maidique, 1988; Shrivastava & Souder, 1987).

Hamilton (1990) posits four basic technology strategy decisions facing established and emerging firms in the early stages of technology evolution. Firms need to decide on the (1) potential scope, or breadth of the technologies, (2) scope of their potential market, (3) levels of commitment and priorities assigned to various innovation activities, and (4) degree of externalization (the extent to which innovation is pursued with or through external agents).

Based on his empirical observations in the biotechnology industry, Hamilton (1990) found changes in strategies over time, and found that strategy evolution is likely to take different trajectories depending on whether the activity involves an established or emerging firm. He noted that such changes may also influence the impact of different types of interorganizational arrangements made by the firms.

Prahalad and Hamel (1990) argue for the importance of clarity of "strategic intent", exemplified by the ability to identify streams of technological and market evolution, to allocate resources to support a vision of the company's future position, and to accumulate the necessary core competencies. Without an integrated vision, the company's existing planning format, reward criteria, definition of served market, and belief in accepted industry practice constrains and isolates innovative activity. In such cases, the only value added by top management is in retrofitting corporate strategy to entrepreneurial activity that does happen to emerge from below (Hamel & Prahalad, 1989).

As noted by Jelinek & Schoonhoven (1990), a lack of top management involvement in the technology process has led to chronic underfunding of many US firm's technology related activities. During business cycle fluctuations, recessions, or other revenue downturns, lack of support may result in cutting support to R&D or new product development. According to Pavitt (1990), Japanese firms are more likely than those in Europe and the U.S. to have a member of the main board responsible for technological policy. It is argued that such high level participation increases the chance that the firm will adopt a longer term technological development policy in response to market pull factors.

Structural Approaches to Innovation

The structural perspective has concentrated on the role of organizational design in the innovation process. Organizational structures are the basic medium for harnessing organizational resources in the quest for successful technological innovations (Shrivastava & Souder, 1987). Indeed, Jelinek & Schoonhoven (1990) found that firms' organizational charts were often regarded as serious competitive information which could reveal how the company organized its work.

Simple Linkages Between Structure and Innovation. Researchers taking the structural perspective have focused on how patterns of social relations affect the amount, rate and permanence of technological innovation. Structure has been related to the amount and quality of information in an organization, the variety of perspectives involved in decision making, and the extent to which members of an organization monitor the external environment (Collins et al., 1988).

Early innovation research has come to some reasonably consistent conclusions about the organizational factors associated with successful innovations. Consistent with classical organizational observations (March & Simon, 1958; Gouldner, 1954), there has been widespread agreement that innovation cannot be maintained by bureaucratic management methods embedded in a traditional hierarchical and functional organization (Bahrami & Evans, 1987; Jelinek & Schoonhoven, 1990; Pavitt, 1990).

Many current studies trace the linkage between structure and innovation to Burns and Stalker's (1961) seminal study of innovation and change in the Scottish electronics industry. They found that mechanistic organizations (those characterized by hierarchical authority, control, communication) had lower rates of innovation than their organically structured counterparts, which were characterized by networks of authority, control and communication. In highly formalized mechanistic operations, work rules and procedures may constitute policies that neutralize managers' attempts to introduce new work methods or machines. Rigid communication channels may not allow for an adequate pool of diverse ideas and awareness of a need for change (Collins et al., 1988).

Many aspects of the Burns and Stalker (1961) study have received widespread confirmation (see reviews by Collins, et al., 1988, Damanpour et al., 1989; Shrivastava & Souder, 1987). The most supportive work concerns the needs for high degrees of coordination for successful innovation.

Interdependencies and Integration. In a review of the literature, Miller et al. (1988) note that a strategy of innovation invokes reciprocal interdependencies among functional specialists in marketing, production, and R&D. Such interdependencies generally require the use of sophisticated integrative devices. Managers from many departments must meet face-to-face to deliberate on the many nonroutine and intricate problems entailed by novel designs and new markets. As noted by Shrivastava & Souder (1987), high degrees of organizational integration are one way of attempting to cope with a dynamically changing environment: the highly integrated firm can more quickly come to a consensus on creative strategies and respond to new environmental threats and opportunities.

The more a firm engages in significant product innovation, the more complex its decision-making task and the greater the incentive for information processing in the form of analysis and interaction. Complex product innovations create special administrative problems. Customer and competitor reactions must be anticipated, novel design and engineering

problems solved, and marketing, production, and financing issues dealt with (Miller, Droge, & Toulouse, 1988; Pavitt, 1990).

While integration is prized, innovation also appears to require a high degree of role specialization. Experts in different functional areas are needed to perform a broad array of innovation-related tasks in R&D, engineering, and marketing (Miller, Droge, & Toulouse, 1988). Bahrami & Evans (1987) found that high technology firms tended to be characterized by multiple roles, with individuals rotated through various assignments in rapid succession. Blending of expertise was accomplished through use of project teams and task forces. Coordination relied heavily on face-to-face, group, and E-mail communication, rather than through standardization of processes, outputs and skills.

Elaborate structural devices to insure adequate specialization as well as coordination might be superfluous and thus rare in firms performing little innovation. Unchanging product lines permit simple and routine tasks requiring few face-to-face integrative devices, experts and specialists (Miller, Droge, & Toulouse, 1988). While such structures may promote efficiency in the near term, they have been linked to solidification, the lack of productivity growth and the eventual demise of the firm if left unchanged.

While there are several studies supporting the need for high degrees of specialization and coordination for effective innovation, blanket arguments in favor of organic structures may be overly simplistic. Robey (1991), for example, maintains that innovative firms like 3M and Procter & Gamble also exhibit mechanistic structural characteristics. He suggests that while the initiation of innovation is facilitated by organic structures, implementation is facilitated by a more mechanistic structure. These different needs may foster structural differentiation, with innovation and implementation performed separately. Robey (1991) maintains that the linking between these functions may be informal (if departmental differences are small and communication is good) or formal (where barriers to communication exist), and that more frequent innovation requires more formal integrating mechanisms (matrix or team based structure) linking the departments together.

Based on their studies, Jelinek and Schoonhoven (1990) found a great deal of lateral communication and less attention to hierarchical status and its symbols in innovative firms. They note, however, that innovation is not random or undirected. Innovative firms need reliable, repeatable methods to bring good ideas from concept to product to market. Clear roles and reporting relationships were used to facilitate this process. The firms in their study tended not to endorse matrix management in the sense of having both a functional and a project boss, as it did not give the firms precise clarity of responsibility, reporting relations and decision making responsibility. The firms did, however, frequently employ "dotted-line" reporting relationships, typically designated as "for information only" (p. 282).

Innovation and Structures to Reduce Uncertainty. Miller (1987) noted that organizational innovation strategies increase uncertainty. Uncertainty reduction may be handled through bureaucratic systems such as formalized rules and procedures, or through

more organic mechanisms such as staff scanning of markets and group decision making. Differentiation may be through increasing the number of profit centers, cost centers, and staff departments, or through delegation of authority and the influence of technocrats. Integration may be through formal cost controls and long-term planning, or through task forces, and coordinative committees. Using two data bases, one of 161 U.S. firms and another of 110 Canadian and Australian companies, Miller (1987) found that firms' levels of product/service innovations were generally strongly and positively correlated with use of most of the organic uncertainty reduction, differentiation, and integration variables. Such innovation was generally only weakly or negatively associated with bureaucratic devices (an exception here was the finding that bureaucratic as well as organic differentiation was associated with product innovation).

Innovation and the Role of Senior Management. Bahrami & Evans (1987) note several structural differences between the high technology firms and both bureaucratic and organic prototypes in their study. A critical difference between high tech firms and organic regimes appeared in the high-tech firms' use of organizational arrangements to align the apex and the core in an attempt to unify strategic and operational command.

The firms studied by Bahrami & Evans (1987) addressed shortening lines of command and communication, reducing span of control, and eliminating intermediaries. The alignment was also facilitated by the operational orientation of strategists, minimal use of intermediaries, reliance on hybrid structures, extensive communication, and informal modes of interaction. This served to speed up the process of strategizing and acting and provided cohesion to maneuver the collective forces of the firm in unison.

The uncertainty surrounding innovation means that many different views may be held: the situation is typically one of advocacy and political debate. Evaluation techniques, technological forecasting, and project estimates may play an important part in mobilizing energy and organizing (Pavitt, 1990). As noted by Robey (1991), managing innovation requires the use of power to overcome resistance to change, to push new ideas ahead, and to protect ideas against premature criticism.

Jelinek & Schoonhoven's (1990) study of high-technology firms in the electronics industry suggested that cultural, managerial and systems approaches were employed to help insure that support for innovative ideas was available, despite the fact that such ideas often originated from lower organizational levels and less senior employees. Such structural approaches as task-focused team management (Jelinek & Schoonhoven, 1990) and the use of executive champions supporting idea champions (Robey, 1991) serve to address such support issues.

Morone (1989) posits that loose coupling of the R&D organization from the day-to-day operations of the business provides needed freedom to explore the potential implications of technology developments inside and outside the firm, while tight coupling to strategic decision making is needed to make strategic use of technology.

Strebel (1987) delineated four different approaches to the organizational cultivation of innovation: widespread team competition, independent task forces, simulated entrepreneurship, and organizational spin-offs. These types differ in their independence from the company's main control system. While widespread team competition is part of the dominant culture, simulated entrepreneurship is often more limited to key personnel. Independent task forces function outside the company mainstream, yet report directly to top management, and are generally integrated back into the main organization once the task is terminated. Organizational spinoffs operate more independently of the parent. Strebel (1987) maintains that the greater the gap between potential innovators in a company and the organizational mainstream (as influenced by the maturity of their industry life cycle), the greater the decoupling required between the corporate mainstream and the organization for innovation.

Burgelman (1984) noted nine different organizational designs for corporate entrepreneurship (direct integration, new product business department, special business units, micro new ventures department, new venture division, independent business units, nurturing and contracting, contracting, and complete spin off). He argued that top management's choice of organizational design should be a function of the operational relatedness and the strategic importance of the new business. High operational relatedness with high strategic importance, for example, suggests strong coupling of the operations of the new and existing business. This provides the control and efficiency with which the business can be managed. With different combinations of relatedness and strategic importance, the particular design alternatives allowing looser coupling may be implemented.

Structural Reconfiguration During Innovation. Given the advantages of both the more mechanistic and organic elements of structure for different aspects of implementing innovation, firms are devising ways of getting both. One way is to alter the structure over time so that it is mechanistic at one point but organic over a period of changes.

Jelinek and Schoonhoven's (1990) study of high technology electronics firms found high levels of structural volatility, permitting firms to configure themselves in response to changing needs and opportunities. While the structure in these high technology firms was frequently realigned, the structure was explicit while in place. Internal stability was derived from strong organizational culture. Bahrami & Evans (1987) also noted the deployment of cultural norms as implicit rules of conduct to provide an overarching framework within which members can operate and use in dealing with unforeseen contingencies.

The shift from one structural arrangement to another was also noted by Poole and Van de Ven, (1988) and Johne (1987). Johne (1987) noted that as product innovation progresses, structural shifts may occur. In a study of British instrument manufacturers, he found that firms which led in the introduction of new technologies tended to use a structure that was predominantly loose during the initiation phase, but tightened considerably during the implementation of the new product, as all departments became involved.

In contrast to the leading firms, Johnes (1987) found quite different characteristics for followers. In follower firms, the gathering of initial ideas tended to involve formalized communication and guidance. After the idea stage (ideas in follower firms frequently coming from higher echelons of the company), follower firms tended to assign the implementation to one department, without insuring consultation with other departments.

In sum, it seems clear that firms can obtain the advantages of both the more organic and more mechanistic structures by astute structural changes that are attuned to the stage of the innovation. However, the firm may or may not be in a position to control the pace of innovation.

Innovation and Interorganizational Relations. Numerous observers note that many firms are responding to strategic challenges of uncertain demand, innovation and inefficiency risks by slimming down and simplifying their constituent units. Under extreme conditions, firms may uncouple themselves into separate activity areas. They may alter the sourcing of goods and services. They may move parts of the production process outside their organizational boundaries. The result is a shift away from hierarchically coordinated transactions and towards market based transactions. This includes both quasi-market resource allocation between loosely-coupled organizational units, and transactions in the external marketplace (Child, 1987; Contractor & Lorange, 1988, Miles & Snow, 1986; Osborn & Baughn, 1990). Child (1987) argues that new information technologies can facilitate the management of external contractual relations by supporting the precise, detailed, and speedy exchange of coded data.

Child (1987) notes several modes of organizing transactions in productive systems ranging from an integrated hierarchy to spot networks. (Intermediate forms include semi-hierarchy, as in multi-divisional firms; co-contracting, as in joint ventures; coordinated contracting; and coordinated revenue links, as in licensing). The forms differ on information codification and diffusion requirements.

As noted by Shortell & Zajac, (1988) such organizational forms as joint ventures (creation of a new entity by two or more organizations to carry out a productive economic activity), internal corporate venturing (creation of separate units within the corporate structure to promote new venture development), and "internal corporate joint venturing" (equity involvement distinct from the parent company, but with internally staffed semiautonomous venture units, which resemble partial spin-offs from the parent firm) are themselves administrative innovations which may facilitate technical innovation.

Powell (1987) notes a general trend toward new forms of external R&D collaboration among previously unaffiliated enterprises. High tech collaboration may also entail gaining fast access to new technologies or markets, may benefit from economies of scale and risk sharing in joint research or production, and may involve contracting for complimentary skills. These may include joint ventures, strategic alliances, equity partnerships, collaborative

research pacts or large-scale research consortia, licensing agreements, reciprocity deals, and satellite organizations.

In recent years, the literature addressing the problems and benefits associated with various forms of external arrangements in technology development (and the conditions under which they are enacted) has mushroomed (Evan & Olk, 1990; Florida & Kenney, 1990; Osborn & Baughn, 1990; Ouchi & Bolton, 1988). A more in-depth coverage is provided under the section on strategic alliances.

Needed Research In Innovation

The distinction made between types of innovation (administrative vs. technical, product vs. product, architectural vs. radical) suggests that organizational arrangements geared to facilitate one type of change may not be appropriately suited for another (c.f. Strebel, 1987). Researchers may need to develop models based on innovation type rather than on innovation per se.

The need to track the mutual influences of both administrative and technical innovations has been noted in the literature (Damanpour, F., Szabat, K., & Evan, W., 1989). Numerous new structural forms are being developed to accommodate innovative demands, but much more work in delineating the conditions under which they are deployed and the type of innovation to which they are suited is needed. Just as researchers have moved beyond a monolithic concept of "innovation," more empirical work to disentangle the constructs of "organic" and "mechanistic" firms is needed in specifying structural effectiveness in implementing change. The works of Miller (1987) and Bahrami & Evans (1987), cited above, represent significant steps in this regard. Research must, however, extend beyond examination of only a single relationship at a time; it must also include configurations or patterns of organizational relationships (Scott, 1990).

Conceptual approaches, such as basing organizational strategy and integration around competencies rather than existing product portfolios (Prahalad & Hamel, 1990), may suggest solutions to innovation roadblocks such as those described by Henderson & Clark (1990). Clearly more work linking the adoption of an idea to the incorporation of strategy and subsequent structural change is needed.

Observations of ongoing structural reconfiguration, changing demands faced by the organization over time and the long time horizon often associated with project development, all suggest the use of longitudinal or quasi-longitudinal approaches. Jelinek & Schoonhoven (1990) employ a longitudinal multiple case study design, basing their work on qualitative data, tapping several sources within each of the firms studied. This allows for multiple perspectives gained from multiple levels (organizational, sub-unit, team, and individual) of analysis.

Finally, Morone (1989) notes that the evaluation of an innovation should include factors besides financial measures of success. Additional criteria include positioning the firm or gaining experience in a new market. If financial measures of success are to be applied, they should be applied to a product family, taking into account the effect of a product on the development of its successors.

STRATEGIC ALLIANCES

Just as the geo-political world of the 1990s is fundamentally different from that of the early 1980s, so too is the world of economic competition. An exclusive focus on firms suggests that they are innovating, learning and downsizing in response to increasing tough global competition. What can be missed is a more radical alteration of what the organization is, what it does and how it does it work.

The literature on strategic alliances and network relationships analyzes the firm as a choice making node in a network that provides goods and services (See Osborn and Baughn, 1990 for an extended discussion). While inter-organizational collaboration is not new, the extent of such collaboration has increased rapidly during the 1980s and 1990s (Dodgson, 1991). The boundaries of firms have become increasingly blurred as companies work together in their economic and technological activities (Contractor & Lorange, 1988; Dodgson, 1991).

Several scholars maintain that future competitiveness of industrial organizations will depend on the ways in which firms interact with one another as market and quasi-market arrangements replace many previously internalized activities (e.g., Miles and Snow, 1986; Osborn, Olson and Hanada, 1985). They argue that the ability to operate in a viable network will be a key source of competitiveness (also see Dodgson, 1991; Lewis, 1991; Perlmutter & Heenan, 1986).

Effective collaboration entails shared responsibility, maintenance of individual identities, the exchange of competencies and transfer of resources on an ongoing basis, as well as a suitable governance mechanism for managing the collaboration. Collaborations among firms entering a new market between buyers and suppliers are quite common. Collaborative arrangements are commonly formed between competitors in the same market or to enter the same market (Morris & Hergert, 1987).

Research in this area has delineated several key issues including (1) the rationale for interorganizational cooperation, (2) partner selection methods, (3) the conduct of negotiations to establish an alliance, (4) the nature of inter-firm control mechanisms and (5) the purported effectiveness of alliances. Several theoretical frameworks have been applied. These include transaction cost view, strategic choice perspectives and learning approaches. Each of these will be discussed in turn.

Definition of Key Concepts and Types of Alliances

Strategic alliances or collaborative arrangements entail shared operations by individual corporate entities on an ongoing basis. While many collaborative arrangements involve only two firms, linkages may be more complex. Included are "spider-web" joint ventures where one firm is the center point for numerous bilateral ventures (e.g. Harrigan, 1985) as are research constraints, long term supply relationships, quasi-shared equity arrangements, joint ventures and so called dynamic networks (See Evan & Olk, 1990, Miles and Snow, 1986; Osborn and Baughn, 1990).

Types of Alliances by the Ties That Bind. Most categorizations of alliances differentiate types on the basis of the ties that bind two systems together and the manner in which they are linked. Many scholars differentiate between so-called "agreements" and the evolution of a new legal entity. Thus, licensing agreements, technology transfer and exchanges, research and development/distribution packs are separated from joint ventures (e.g., Contractor and Lorange, 1988; Forrest, 1990; Harrigan, 1985; Osborn and Baughn, 1990). Joint ventures may be separate from equity investments to connote a greater degree of involvement or intermingling of the participating firms.

Arrangements may also be separated solely on the basis of the formula used to compensate each partner as well as on the strategic impact on one or both partners. Contractor and Lorange (1988) present a listing of various types ranked on the extent of the interorganizational dependence they entail. Linkages can range from technical training/startup agreements (negligible interorganizational dependence) to equity joint ventures (high interorganizational dependence).

Osborn and Baughn (1991) have conceptualized the degree of engagement in alliances as concomitant with (1) the time span of cooperation (from one production cycle to many), (2) the potential scope of adjustments by the sponsors (very little adjustment to strategic reorientation), and (3) the sophistication of the mechanisms for mutual adjustment between partners (a simple contract to a new organization). Their work suggests that in newly emerging industries, increasingly sophisticated alliance relationships are used when neither partner has a dominant market, technological or competitive position.

Teagarden and Von Glinow (1988) suggest that alliances can be differentiated on two dimensions: an obligation dimension, and an involvement dimension. The obligation dimension defines the profit allocation structure and the rights/obligations of each party. The involvement dimension taps the degree of interdependence between the sponsors and the locus of decision making. They have found wide variations in alliances concerning operating autonomy, parental strategic flexibility, partner interdependence and operating decision control.

The Emerging Character of Alliances. There are two major difficulties in categorizing alliances. One, businesses are constantly creating new combinations that intermingle different

elements of their operations. These new alliances can dramatically alter the conception of a partner. For instance, a singular firm may keep strategic decision making within the firm and move all other operations outside its boundaries through alliances. A firm may keep financial control but allow strategic choices as well as production, distribution, marketing, and accounting functions to flow to a network of alliances. Some of these alliances may be simple contracts (e.g., maintenance contract or contracting out all non-managerial employees) while other may be joint ventures (say for production in Asia).

The second major problem involves the unit of analysis. Scholars have tended to emphasize the needs of a dominant "parent" organization and what it might get from an alliance (e.g., Harrigan, 1985). This is only part of the picture. The interests of all parties and those of the alliance itself need to be considered. For instance, it is quite possible that a particular alliance for a firm may appear to be a failure in that it does not provide financial returns to the sponsor directly. A more sophisticated analysis might suggest that the alliance itself is successful in reaching its goals and contributes in an indirect financial way to the sponsor. For example, Toyota and GM have a large joint venture to produce autos. Toyota may be using this joint venture to block quota legislation in the U.S. GM may be using it to learn how to manage more effectively. Meanwhile the venture itself is producing autos. Is the alliance a success? It seems to depend partially on success to whom--Toyota, GM or the joint venture--as well as success on what grounds.

Dominant Perspectives. Given a brief definition of alliances, the range of types and the emerging character of these strange entities, it is easy to see the need to analyze these comparatively new organizational forms more systematically. The next section of the review will concentrate on (1) the rationale for cooperation, (2) partner selection and initial negotiations, (3) control mechanisms, and (4) alliance effectiveness.

Rationale for Cooperation. In linking up with another firm, partners may enjoy options otherwise unavailable to them, such as better access to markets, pooling or swapping of technologies, and larger economies of scale. Most studies of inter-organizational collaboration include a list of motives for such collaboration. These include capital requirements beyond the scope of a single firm, desire to enter new geographic markets, desire to bypass governmental restrictions or meet federal mandates expeditiously, high costs of technological development, increasing technological complexity (leading to a need to merge several fields of knowledge and to broaden a potential product's scope beyond that which was possible through purely internal development), creating technological standards, and improving speed to market of new products (Dodgson, 1991; Harrigan, 1987; Lorange & Roos, 1991).

The development of collaborative arrangements can be also attributed to such environmental conditions as improved information and communication capacity, rapid technological change, globalization of industries, trade constraints and barriers and strong international competition (Auster, 1987). While most collaborative arrangements involve only two firms, linkages may be more complex, as in "spider-web" joint ventures (Harrigan, 1985);

research consortia (Evan & Olk, 1990); and dynamic networks (Miles & Snow, 1986). Within an inter-organizational network, major components (individual firms) may be assembled and reconfigured in order to meet complex and changing competitive conditions.

Partner Selection and Initial Negotiations. Several observers have noted the importance of initial assessment of partner complementarity in business and technology strategies. A "strategic match" between partners must be established (Dodgson, 1991; Harrigan, 1985; Lorange & Roos, 1991).

According to several investigators, early negotiations must establish a strong basis for collaboration. At formation, there may be mixed motives and hidden agendas by both parties. Further, goals and priorities may change over time, leading to potential conflicts of interest. Observers recommend that negotiations must delineate each partner's relevant resources and responsibilities as well as possibilities for evolution of the cooperation. As Weiss (1987) has noted, such negotiations may be quite complex, involving multiple actors and audiences (including state and local governments, suppliers, and unions).

Hybrid organizations appear to have a special need for institutional leadership during formation to allow them to develop a common purpose and understanding. Conflict resolution is often difficult to achieve because partners often do not share a common environment or domain, and therefore lack a foundation for generating a common understanding about the purpose of the hybrid and the process by which that purpose can be achieved (Borys & Jemison, 1989).

Bell (1987) suggests that two initial teams (a negotiation team consisting of financial executives and lawyers responsible for delineating the terms and conditions for operating as a partnership, and a business coordination team to work out the details of day-to-day operations) should operate in tandem to establish strategic alliances. Too often, he notes, these issues are treated sequentially, with recognition of discrepancies in operating assumptions arising only after the alliance arrangements have been formally completed.

Initial concerns will also include problems associated with risks of sharing proprietary know-how and intellectual property rights (Contractor & Lorange, 1988; Dodgson, 1991; Lyles, 1987). Osborn and Baughn (1990) suggest that difficulties in protecting core technologies often lead smaller firms into contracts rather than more elaborate alliances forms so that they can block intrusion by a partner.

Control Mechanisms to Manage Dependency. The choice of strategic or operating control activities appears to be particularly critical in joint ventures, as joint ventures represent the partial holding of two or more parents. Joint venture control is seen as involving three dimensions: (1) the focus or scope of activities over which parental control is exercised, (2) the extent or degree of control, and (3) the mechanisms parents use to exercise control (Geringer & Hebert, 1989).

Insufficient or ineffective control over a joint venture can limit the parent firm's ability to coordinate its activities, to utilize its resources effectively, and to implement its strategy. A parent firm may want to insure that the joint venture fits in with its other activities. A partner may want to make certain, for example, that new-product developments are complementary to its existing product line to encourage tie-in sales of these new products. The firm may also seek to avoid markets where it sells its own products. Control mechanisms may also be necessary to prevent undesired leakage of innovations or know-how to partners or to organizations outside the venture (Contractor & Lorange, 1988; Geringer & Hebert, 1989; Harrigan, 1985).

Control mechanisms may include terms of the bargaining agreement between parents, composition of executive boards of directors, appointment of key personnel and personnel rotation, and reporting relationships (Geringer & Hebert, 1989; Harrigan, 1985). More informal controls may also be established to the extent that a common set of values, style and culture can be molded (Perlmutter & Heenan, 1986).

Harrigan (1985) has spelled out conditions under which parents' needs for control and the joint venture's need for autonomy will vary. According to Harrigan, the joint venture's need for autonomy increases as the speed of competitive response needed increases, but will decrease as similarities between parents' and venture's stated missions increase or as the value and scope of resources shared among them increase. The degree of control will rest largely on the degree to which interaction with the parents' ongoing business units is needed to achieve the joint venture's purposes. This will reflect, among other things, the parents' needs for intelligence generated through the venture as well as industry volatility. Unfortunately, Harrigan (1985) does not discuss the needs of all parties nor what occurs if the needs for control by the parties clashes.

It is most interesting to note that in the U.S. the issue of control appears to be of paramount importance. Assuring mutual benefit under a comparatively wide variety of alliance activities appears more important in literature concerning Asian and European alliance. Managers are beginning to learn that formal control mechanisms simply may not work in alliances. Instead they need to be more astute in influencing the actions of the alliance and its members.

Alliance Effectiveness. It is notoriously difficult to define and develop a uniform measure of success in collaboration. Distinct firms' circumstances, expectations and experiences lead to difficulties in defining the success and failure of inter-organizational relationships. Even the often-cited instability of joint ventures may not, as Gomes-Casseres (1987) points out, necessarily reflect high levels of failure in these forms relative to their alternatives. In general, however, observers note that such collaborations are quite difficult to manage (Contractor & Lorange, 1988; Dodgson, 1991; Doz, 1988; Harrigan, 1985).

Several observers have noted that strategic alliances may present operational difficulties greater than those associated with wholly-owned business ventures (Geringer &

Hebert, 1989; Lorange & Roos, 1991; Harrigan, 1985; Osborn & Baughn, 1990). Because more than one party is involved, decision-making is often more complex. This may be further accentuated by the existence of separate (and potentially conflicting) corporate cultures and the actual strategic intent of both participants (Lorange & Roos, 1991). Therefore, firms need to adopt structures and procedures in the management of their collaborations which are adaptable and flexible. At the same time, managers need to be highly aware of the need for influence over, and a balanced exchange of, information.

One interesting variation on the issues of alliance effectiveness is offered by Osborn, Olson and Hanada(1985). They maintain that the reasons for alliance development are often extremely complex and involve a number of partially conflicting expectations. They suggest that the effectiveness of the alliance may emerge from its activities. That is, managers may note accomplishments, reinterpret history to match the noted accomplishments, and then deem the alliance a success.

Application of Existing Theoretical Perspectives

From the analysis of specific issues, three quite different theoretical approaches have been applied in the study of alliances. The first, transaction cost theory, attempts to explain when a firm will incorporate a series of activities within its boundaries and when it will use either the market (e.g buy from a variety of suppliers) or an alliance. The driving causal mechanism here is efficiency. A second view borrows heavily from systems and strategic choice views of organizations to examine the ways in which alliances can be used to the benefit of the organization. Finally, with so many alliances involving high tech firms located in different countries, a learning approach has been applied to these entities.

Transaction Cost Views of Alliances. A most commonly applied theoretical framework in analyses of strategic alliances is the transaction costs theory from institutional economics (Williamson, 1975). In this framework, analyses are based on assessing the relative cost efficiencies of markets versus hierarchies. The option of market, hierarchy, or intermediate governance structure is decided primarily according to transaction cost reduction (Hennart, 1988). In certain conditions, alliances may be a more efficient form of governance structure than either contracts in markets or full internalization within a single organization.

As several writers have noted, firms may use a wide range of transaction forms in implementing cooperative strategies (Anderson & Gatignon, 1986; Contractor & Lorange, 1988). The choice among governance forms, within the transaction cost framework, rests on the relative collaborative efficiencies of these forms (Dodgson, 1991).

The transaction cost analytical framework incorporates the costs of setting up, running, and monitoring an arms-length market transaction on one hand, and the costs of running the organization, on the other hand. Transaction-cost economics helps establish when the balance may shift in favor of market mechanisms or in favor of the integrated firm. The relative transaction costs are themselves a function of the frequency with which transactions recur, the

uncertainty to which they are subject. and the degree to which they are supported by durable and specific investments (Koenig & Thietart, 1988).

A critical assumption in these analyses is the potential for exploitation. It is expected that, given the chance, one firm will take advantage of another. Market transactions (involving exchange between autonomous economic entities) may be hazardous or cumbersome when information regarding circumstances relating to an exchange is asymmetrically distributed between the parties or when contracts cannot adequately specify the parties' responses to changing conditions over the duration of the contact.

Given the proclivity of parties to behave opportunistically under ambiguous conditions and the high costs frequently associated with achieving information parity, the transaction costs of market exchanges may outweigh their benefits. Hierarchical internal organization will become the preferred operating mode under conditions of substantial uncertainty and complexity (Jones, 1983; Williamson, 1975). Incentives to exploit information differences opportunistically shrink when the parties place transactions in a single hierarchy. Further, such internal organization may enhance information coding, the convergence of expectations, and auditing control, though at greater costs than when price alone can moderate the exchange between parties (Williamson, 1975).

Interorganizational network arrangements are seen as transactions that fall "between markets and hierarchies" (Thorelli, 1986; p. 37), or as "quasi-markets and quasi-hierarchies" (Osborn & Baughn, 1990; p. 504). While transaction cost analysis is sufficiently general to incorporate inter-organizational hybrid linkages, it has been criticized for its lack of richness in explaining the variety of issues raised by these new forms (Borys & Jemison, 1989; Kogut, 1988; Osborn & Baughn, 1990). Further, the governance forms predicted by this theory were not found in several large scale analyses of alliance governance (See Osborn and Baughn, 1990 for a review).

Strategic Analyses of Alliances. Though not a unified theory, a framework based on strategic analysis emphasizes the role of collaborations as a means of influencing industry structures as well as firm competencies. Collaboration may shape competition by raising entry costs, increasing price-performance differentials and encouraging mutual dependencies among certain firms (Dodgson, 1991). Alliances may also be used to build a network of competencies.

While transaction cost and strategic behavior theories share several commonalties, they differ fundamentally in the objective attributed to firms. Transaction cost theory posits that firms transact by the mode which minimize the sum of production and transaction costs. Strategic behavior approaches posit that firms transact by the mode which maximize profits through improving a firm's competitive position, sometimes in relation to rival and sometimes in relation to competencies (e.g., building a business).

Transaction cost approaches address the costs specific to a particular economic exchange, independent of product market strategy. Strategic behavior frameworks address how competitive positioning influences the asset value of the firm. Here, joint ventures may be motivated by strategic attempts to deter entry or erode competitors' positions (Kogut, 1988). The implications of the two approaches may differ. Under transaction cost analysis, for example, partner selection would reflect cost minimization, where a strategic perspective would emphasize selection based on perceived improvement in the competitive position of the parties (including collusion or depriving competitors of potential valuable allies) (Kogut, 1988).

Kogut (1988) suggests that while transaction cost theory may be useful in analyzing problems in bilateral bargaining, the decision to form an alliance itself may represent a more costly, though more profitable, alternative to other choices. Kogut (1988) suggests that the strategic perspective could be extended further to incorporate the possibility that joint ventures are another mode by which markets are replaced by organizational coordination. That is, joint ventures may be a means by which large organizations increase their control through ties to smaller firms and to each other.

More recent analyses of alliances have built on this tradition to suggest that the immediate cost issues in alliances are but one small part of the strategic issues facing firms. Osborn and Baughn (in press) suggest that alliances may be used to build competencies, establish new industry structures and/or protect the firm from a number of non-economic intrusions (e.g., governmental interference, dominance by foreigners and the like).

Learning Through Alliances. Alliances may also be a means by which firms learn or seek to retain their capabilities. Several observers have noted the utility of alliances as learning mechanisms (Baughn & Osborn, 1990; Dodgson, 1991; Hamel, 1991; Kogut, 1988; Pucik, 1988). Prahalad & Hamel (1990) note that Japanese firms have established webs of alliances to acquire competencies at low cost. Other observers have suggested that such alliances may accelerate the diffusion of technological advantage from American firms to competing firms overseas (Dreyfus, 1987; Kotkin, 1987).

The differential ability of firms to learn quickly has been found to give rise to asymmetric benefits and shifts in relative power in a competitive partnership (Dodgson, 1991; Pucik, 1988). Such shifts may lead to early termination of a venture (Hamel, 1991). Therefore, cooperation may help or hurt, depending on how a firm learns compared with its partners (Lewis, 1991).

Learning requirements may also affect the form of the alliance. Market mechanisms may be effective for transferring codified knowledge, but less useful in the transfer of organizationally-embedded, "tacit" knowledge (Kogut, 1988; Osborn & Baughn, 1990; Polanyi, 1967).

Reich & Mankin (1986), among others, have articulated processes by which American firms have lost competencies by delegating such activities as plant design and engineering responsibilities to joint venture partners. Relative to their Japanese counterparts, American firms are seen as losing the opportunity to innovate and learn how to improve existing product designs or production processes. In so doing, they may lose control over subsequent product generations.

Organizational learning perspectives should, according to Kogut, (1988) apply reasonably well to ventures in industries undergoing rapid structural change, whether due to emergent technologies which affect industry boundaries or the entry of new firms. This perspective might also benefit by incorporating the literature in innovation and diffusion of innovations.

Rather than focusing on learning by the parent firms, Lorange & Probst (1987) have emphasized the need for the venture itself to generate learning and feedback measures. They note that many joint ventures fail because they have not been designed with sufficient adaptive properties to cope with emerging environmental turbulences (Lorange & Probst, 1987). The control processes instituted by the parental firms may preclude venture planning and self-monitoring, generating feedback measures that fail to facilitate self-corrective venture adaptation. Failure to build up a learning process may also stem from fragmented managerial loyalties, such that tasks are carried out on an ad-hoc basis. In this view, ventures need a fair degree of autonomy, as well as sufficient resources for flexibility (Lorange & Probst, 1987).

Needed Research on Alliances

The explosion in collaborative activity among organizations has been accompanied by intense research attention. Research endeavors have included observation and case study methodology (Harrigan, 1985; Weiss, 1987), large scale secondary-source presentations (Hergert & Morris, 1987; Osborn and Baughn, 1990), and survey programs (Lyles, 1988; also see Geringer & Hebert, 1989).

Each procedure, of course, entails strengths and weaknesses. The observation and case study methodology often provides rich descriptions of factors associated with alliance success and failure. Koenig & Thietart (1988), for example, compared alliances in the European Aerospace industry. They noted that those which failed tended to be highly centralized and politically managed, with poor coordination and adaptation mechanisms. Harrigan's work in strategic alliances demonstrates the complexity of industry, technology, strategy, and control issues involved in alliance formation and implementation.

Large scale data-based studies help provide an overview of trends in alliance formation (see Dodgson, 1991; Hergert & Morris, 1985) which may reflect salient changes in environmental conditions. Such data has also been used to test theory-driven propositions, though often by sacrificing control of possible alternative explanations.

It would appear that the wealth of observational data acquired through such studies could now be applied to the reworking of extant organizational theory in accounting for alliance form and viability. Because of the need to share resources and governance structures from existing organizations, traditional theoretical models based on unitary organizations may be inadequate in addressing alliance and network issues. Borys & Jemison (1989), for example, have proposed a model of interorganizational arrangements which is based on the four issues of breadth of purpose, boundary permeability, value creation, and stability mechanisms. These issues are seen as mutually determinant and interdependent. While their model may be one of several applied to subsequent empirical study of hybrid forms, it represents an attempt to incorporate observations in a useful framework.

This review has also suggested the limited applicability of any single (transaction cost, learning, strategy) perspective in understanding alliances. The ability to integrate such frameworks may provide fuller comprehension of these entities. Further, analyses of innovation and innovation diffusion needs to be incorporated into these analyses as does an analysis of the environmental conditions surrounding the formation of alliances.

SUMMARY

In summary, organizations in the 1990's face a number of daunting challenges. Four have been discussed in this chapter. Managing retrenchment, learning, innovation, and the formation of alliance and networks appear to be central to the development of high performing organizations.

Individual treatment of each of these topics suggests that a more parsimonious model is needed to help integrate much the literature. The next chapter provides movement toward such an integrated model.

CHAPTER VI

TOWARD AN INTEGRATED VIEW OF ORGANIZATIONAL DESIGN

This report reviews a vast number of interesting and partially conflicting views of organizations, organizational designs and the causal mechanisms that drive systems apart or toward some unified objectives. Clearly, there is no one central view of organizations and their designs. However, in order to move toward a productive, useful research agenda, it is necessary to attempt a partial integration.

This chapter consists of three major parts. Part one presents a partial integrated model of organizations on a static basis. Analytical, metaphorical and graphic representations of the new perspective are offered. Part two discusses organizational dynamics. Part three suggests how the newly proposed model can be used to help chart research themes concerning important issues.

A STATIC APPROACH TO AN INTEGRATIVE VIEW OF ORGANIZATIONS

By examining an organization at a particular point in time, it is possible to highlight specific aspects and chart a starting point for a more dynamic analysis.

Analytical Perspective

The organization is a system composed of partially competing interests held by individuals and their representatives. As a system, the organization must export more valuable goods and services than it imports. Through interaction among individuals, units and firms, collective interests arise that may or may not be congruent with one another. Organizations are hierarchical; the structure of the organization is the pattern of specialization, control and coordination through which goals are identified and accomplished.

As a complex system operating in conjunction with, and in partial opposition to, other complex systems, the organization is subject to a number of partially conflicting pressures for rationality (survival and goal attainment), internal consistency/cohesion to maintain the power to operate, congruity with societal expectations and the enhancement of individuals. Each of these pressures can be elevated to the status of a primary causal mechanism that the analyst expects drives or should drive the organization. While an emphasis on any one of these causal factors highlights some relationships, it naturally downplays others.

In this view of organizations, organizational design is a pattern among three primary components: (1) the context of the organization representing its size and technology, (2) the structure showing the intended patterns of specialization, control and coordination and (3) emergent processes to represent the on-going patterns of strategy, leadership, learning, culture and the perceptions of structure.

It is important to recognize that a large firm may not have a singular organizational design. Instead, the overall design may reflect attempts to link quite disparate businesses under a common umbrella. In these cases, the question of design may be fruitfully examined by (1) separate analyses of the businesses contained within the firm and (2) an overall description of how the various businesses are linked together. In some cases the linkages of various businesses may be solely through common ownership, a small central staff, and a common board of directors. Conglomerates are often good examples. Often the analyses of how to link apparently separate businesses are discussed under the term organizational governance. The term organizational design may be reserved for the patterns among context, structure and emergent processes where one common description can accurately characterize a single overall pattern.

This attempt to provide partial integration of several apparently separate lines of inquiry can immediately yield confusion since quite different causal mechanisms are expected to operate simultaneously. To illustrate this complexity, a more systematic examination of several key causal mechanisms appears warranted.

Open Systems Linkages and Rationality. An open systems view emphasizes very specific rational relationships among the variables under the assumption that the organization must provide more valuable outputs than it imports. This theoretical perspective provides a basis for subsequent additions since it helps the theorist list many of the potentially important variables.

This view provides a rough definition of outcomes, the task/industry setting, the institutional setting, the systems context, and organizational structure. In great abbreviation the key variables are defined as follows.

The institutional setting is the mix of historical, legal, economic, political, social, educational and cultural factors facing all organizations operating within a common geographical area. The task and industry setting is the set of other firms that the focal organization needs for growth and survival. For studying changes in the degree of goal attainment, this segment can be described in terms of its munificence, uncertainty and interdependence.

In some analyses the institutional, task and industry setting are combined under one label, the environment of the organization. Here, they are kept separate primarily because the causal mechanisms linking the institutional setting to organizational factors (e.g., organization structure) are expected to be different from those linking the task/industry setting to organizational factors. Specifically, analyses of institutional conformity call for a more specific analysis of precisely which factors in the institutional setting are important and how the organization appears to conform to societal expectations.

The systems context is the size, scope, and technology of the firm. Both technological sophistication and variability are considered important contextual conditions. The

organizational structure variables include the patterns of vertical specialization and control, horizontal coordination, and the degree of variability in these components up and across the organization. For convenience, all the organizational factors and their components are described so that more of an attribute (e.g., munificence) connotes greater complexity.

The basic proposition is that the chances of organizational survival (and goal attainment) are enhanced when the environment (institutional setting plus the task and industry setting), systems context, and organizational structure "fit" together. In other terms, where the degree of complexity of the variables is matched, survival potential is maximized. This relationship is graphically depicted in Figure 1.

Decomposition of the Fit Relationship. Figure 2 shows a somewhat more complicated pattern of relationships. All main effect arrows are two-headed to show the reciprocal influence of the variables on one another. The single headed arrows show interactive relationships among the organizational factors and outcomes.

Arrow 1 shows the relationship between the task environment, industry setting, and the systems context. A derivative of the general proposition stated above is that a more complex industry and task setting calls for and allows for more technically sophisticated and varied organizations. Arrow 2 shows a similar linkage between task and industry conditions, and organizational structure. To emphasize the reverse flow (from design to environment), organizations with more complex structures tend to gravitate toward more complex industries. In a more conventional position, if the industry declines, often the organization must restructure itself. Arrow 3 links systems context with the organizational design. For instance, larger organizations are expected to have more vertical specialization and control than smaller ones. If not, survival potential is diminished due to the lack of sufficient capacity to handle the additional volume and exceptions.

Arrow 4 links the design directly with organizational outcomes. Here, a derivative of the base proposition is that more complex designs allow for a greater potential for societal contribution, goal attainment and such systems outcomes as efficiency, flexibility and adaptability, holding all other factors constant. Of course, the heart of the open systems view is that other factors cannot be held constant. Thus, the tangle of arrows labeled 5 is another way of showing a part of the fit proposition. The combined effect of task and industry setting times systems context times organizational design is represented. Not shown on the graph, but potentially important, are direct relationships between task and industry setting, and systems outcomes, as well as the systems context and outcomes.

The logic underlying all of these relationships is comparatively simple. A lack of fit causes organizational survival problems. If the environment is more complex than the context or design, for instance, the firm loses potential business and invites competitors.

Figure 1
An Open Systems View of Organizations

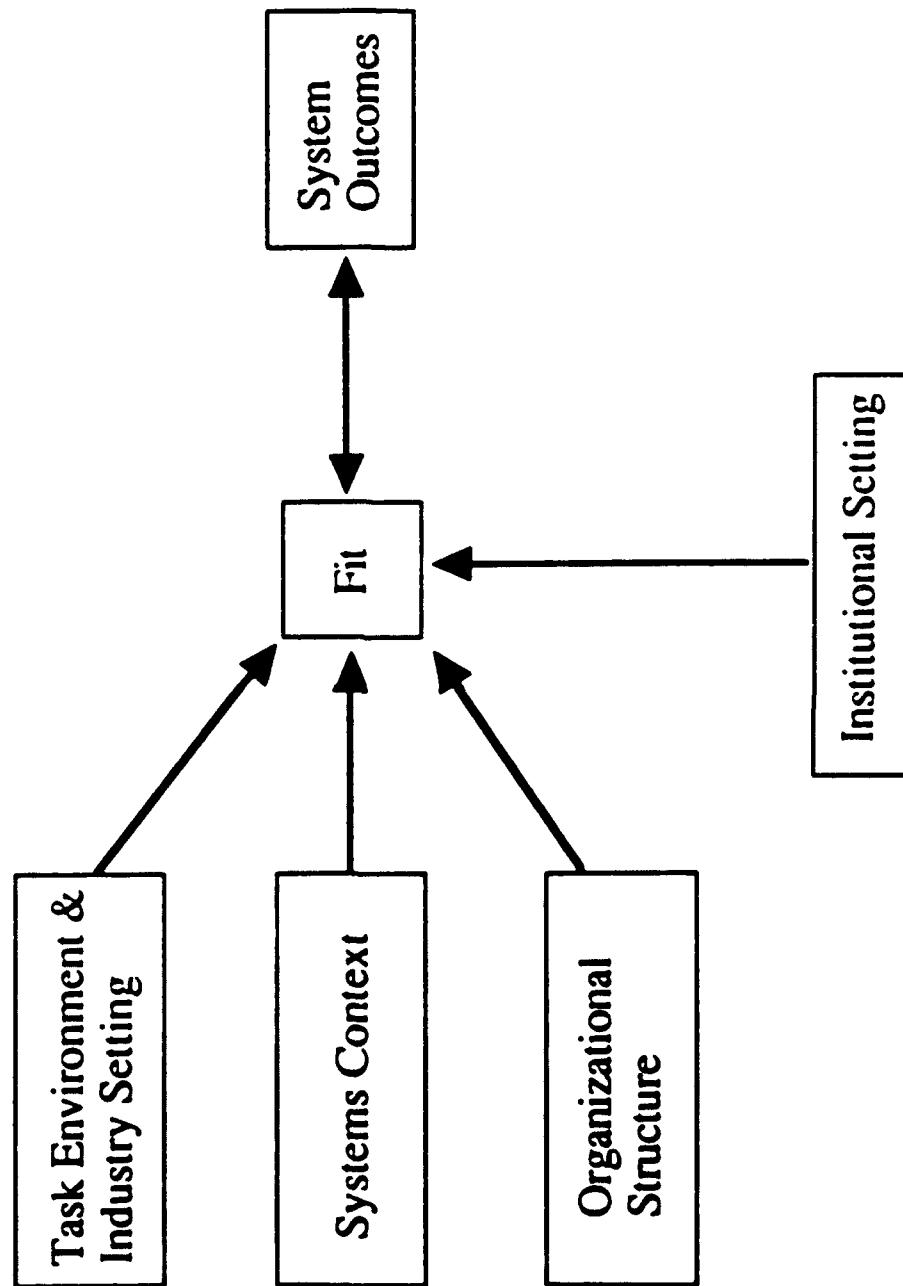
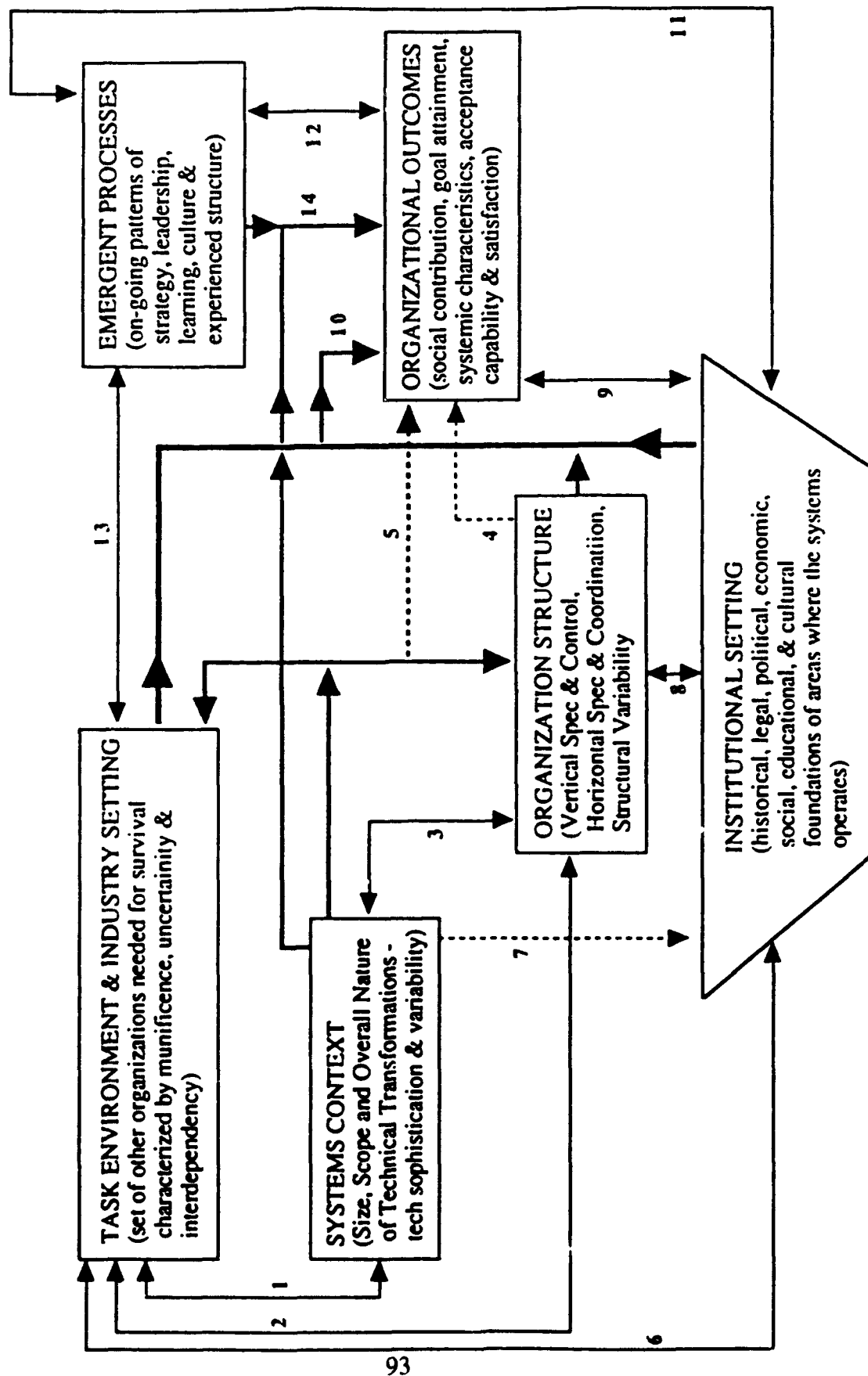


Figure 2

A Static Depiction of the Proposed Integrative View of Organizations



eventually leading to its own demise. Given the number of variables, the number of subcomponents within each variable category, and the number of possible linkages among the categories and variables, it is clear that the open systems model presents a daunting challenge to those who wish to test it.

Population Ecology. One important variation of a systems model using an apparently different logic is that of population ecology. All other outcomes are relegated to that of systems' survival. Collections of similar organizations are studied to see which types survive and what the empirically generated rules for survival appear to be. In different terms, there is an attempt to simplify and combine a number of systems context variables and organizational design variables. Charting the birth and death rates for similar organizations is expected to yield a consistent description of the 1,2,3,4 pattern linkages from environment to survival under a "selection" or survival of the fittest approach.

While the unit of analysis is quite different, the underlying logic is virtually identical. And many of the organizational variables mentioned by writers in population ecology such as R versus K specialists can be easily reconceptualized into early entrants versus later entrants. Separate measurement of organizational structure and the prior performance record of the organization may also be added to the analyses to provide more accurate predictions of survival rates by type of organization.

Strategic Choice. One interesting variation is to analyze the strategic choices of firms alone and in combination with one or a number of environmental, contextual and organizational design variables. The analysis of choice is driven by the need for survival and rationality. The logic of the systems and population ecology approaches is supplemented with an analysis of the overall actions the organization should take toward key constituencies (toward customers in the case of the popular view of strategy). Following this logic, it is also possible to redefine strategic choice historically in terms of the systemic capabilities of the firm based on its size (yielding economies of scale), technological sophistication (yielding the capability to produce new, novel products and services), and technological variability (yielding the ability to survive in a turbulent setting with a more diverse set of products and services).

Where strategic choice is expected to evolve from interaction among decision makers, it will be discussed under the analysis of a power and control logic. Analyses of strategy would also need to be concerned with the degree of institutional absorption or the extent to which actions were taken to legitimate the firm. And analyses of strategic choice would be incomplete without a discussion of the actions emerging from middle and lower management as these individuals attempted to get along within the organization and cope with the goal requirements placed on them.

Institutional Factors. The logic underlying an institutional view is the congruity of expectations. Essentially, organizations are expected to absorb the goals and solutions that are most popular. Organizations are most open to external influences at their founding, during

periods of crisis and/or during threats to their survival. Essentially, the major concern is the legitimacy of the organization in the society and legitimacy is gained by absorption of others' interests.

Returning to Figure 2, arrows 6, 7, 8, and 9 show the linkages between the institutional setting, the task and industry setting, the systems context, the organizational design, and organizational outcomes. For instance, the organization may adopt a posture of social responsibility (arrow 9). Arrow 10 shows a much more complex linkage involving institutional factors in interactive combination with the open systems variables. Here again, the basic causal mechanism is consistency rather than the necessity to increase survival potential.

Arrow 11 also shows that the institutional setting has a major influence on the emergent processes within organizations. A whole series of studies shows systematic differences across cultural settings in leadership, learning, organizational culture, and experienced structuration (e.g., expected degrees of centralization/ decentralization). Much more work needs to be done on the degree to which organizations merely absorb popular solutions and use them in conditions of turbulence (cf. Stinchcombe, 1965, 1990).

Emergent Processes. As the analyst moves to the arena of emergent processes, the logic changes as well. No longer does systems rationality or societal expectations dominate. Instead, the desires and wants of individuals play a much more prominent role, individually or collectively. Choice replaces determinism.

Before moving more deeply into some of the choice approaches, it is important to note that a systems, population ecology, strategic choice or institutional logic can be used in analyzing emergent processes. For instance, systems leadership approaches and stratified systems theory each impose a systems rationality on leadership processes to derive propositions and hypotheses. Chandler's now classic analysis of strategy-structure linkages evokes a similar causation scheme. And more recent analyses of strategy have added capability to the list of commonly desired systems outcomes.

However, a key to understanding emergent processes is to evoke a different causal mechanism. The rationality of the systems, the need for consistency with externalities and the desires for efficiency now become constraints, not mechanisms yielding outcomes. Within very broad limits people define what is desired, what exists, what is important, and who will be considered important as they attempt to reach goals and get along.

- Analyses of Organizational Culture: An Example of Emergent Processes. To illustrate the range of analyses under the category of emergent processes, consider the following. Schein (1985) in his discussion of organizational culture carefully notes that culture is a collective response to basic member needs to get along and achieve goals.

The culture may evolve at three levels. Level one (1) is a surface level of rites, rituals and other observable aspects of culture. Level two (2) is less obvious and involves "shared" values (the term "shared" here refers to a common exposure by all organizational members, not necessarily that all individuals subscribe to a single value set). Level three (3) is the deepest and involves "shared understandings."

Using much the same language but placing much more emphasis on the role of senior management, Deal and Kennedy (1982) suggest that senior managers should establish, guide, and reinforce a specific competitive culture. They downplay or ignore the emergent aspects and emphasize those elements of culture top management wants subordinates to adapt. Who is correct? Both may be for different parts of the organization and at different times.

When the organization is new and during a crisis, senior management may have a profound influence on the entire corporate culture. By establishing visible elements of culture (e.g., rituals) senior management may help mold the organization's culture. However, as noted by Schein, among others, there are limits placed on top management by the larger culture and the needs of subordinates to cope and reach toward their goals.

- **The Diversity of Emergent Processes.** In larger organizations, different parts of the system may have quite different emergent processes. It may or may not make sense to provide an organization-wide description of leadership, learning, culture or experienced structure. For instance, in some parts, members may see a decentralized pattern of decision making for salaries and promotion. In other parts, the senior management may make these choices.

In larger organizations, where top management is naturally more remote than in small firms characterized by face-to-face contact, a number of subcultures may emerge. These subcultures may or may not appear consistent with the overall desires of senior management and they may well be molded more by the actions of managers than by their hopes for a specific type of organizational culture. For instance, senior management may want all members to believe that they are part of one team. If senior management secures multimillion dollar salaries during a period of corporate austerity, those toward the bottom may not see a team. Instead they may see an us-versus-them scenario.

- **The Role of Emergent Processes in Predicting Outcomes.** Returning to Figure 2, the arrows 12, 13 and 14 show some of the linkages involving emergent processes. Consider arrow 13 linking task environment and industry setting to emergent processes. One logical element of this linkage is to related munificence in the task environment. Greater munificence within the task and industry setting may be linked with the freedom of top management to pursue individual desires. Somewhat more innovative research might reverse the direction of the arrow to investigate how different types of top management tend to define their industry setting. For instance, how long a time span is considered by senior management and what influence over the development of the industry do they believe they might possess?

Just as it is easier to analyze a firm under the assumption that it has a singular goal (e.g., efficiency), it is easier to analyze emergent processes if it is assumed that participants have a singular objective (e.g., power, greed, or altruism). While the proposed integration lists a number of emergent processes, not all of these are driven by common causal factors. It is the multiplicity of demands, constraints and opportunities that is illustrated by incorporating emergent processes.

Some of the chief difficulties in incorporating emergent processes to reflect more realistically what happens to and within organizations include (a) the redefinition of the variables in the model by participants, (b) the variety of interests pursued within the organizational context, and (c) the willingness of participants to explain their behavior in rational terms when they are seeking personal goals. For example, what Chief Executive Officer flies first class because he prefers the perks? All will suggest that they are more rested, can get more work done, and have less problems if they have the additional space.

While the addition of emergent processes complicates analyses, it should dispel a central mythology of the systems and rational approaches. The organization is rarely a whole but instead a complex array of pieces and parts. Precisely what pieces and parts are important, when they are relevant, and how they may or may not work together is an extremely important aspect of analyzing a proposed organizational design.

Systems Coherence, Power and Control

So far the analysis has emphasized the complexity of organizations and the divergent forces pulling the organization in many different directions. The discussion has minimized the hierarchical character of organizations and yet this is a central feature of these complex systems.

Drawing on work from organizational economics, stratified systems theory, and technological development it is possible to build an argument for power and control dynamics as important causal mechanisms that help provide the glue that binds units and subsystems together. The argument is easiest to see for technological factors. A more complicated case needs to be built for power and control.

Technical Control and Coordination. The throughput process of an organization provides a powerful integrative mechanism linking individuals and units together in a rational, understandable way. To produce goods and services, individuals and units must contribute specific efforts and coordinate their actions. A lack of effort or coordination may be immediately obvious in reduced production or service volume and/or quality. In the market, the penalty for lower volume and/or quality can be swift and deadly.

As noted in the discussion of transaction cost economics, organizations arise as a more efficient mechanism for coordination under conditions of potential exploitation. They also arise where the technology itself can provide the needed specializations and coordinated

feedback. Where the technology cannot provide this specialization and feedback, it may be provided by individuals and their derivative systems operating through linked technical systems. As noted in the discussion of the professional bureaucracy, linking separate technical systems together in a loose confederation (e.g., a university or a hospital) causes some difficulties, but these can be overcome if the systems are (1) comparatively small, (2) loosely controlled, and (3) operate as quasi-markets.

Mutual adjustment among members can be guided by technological factors within comparatively small units. Members can see the cause-effect relations in these units and experience the feedback. Professionalization, craftsmanship, and common supervision can provide sufficient mechanisms for coordination and control. A central problem comes in large organizations with multiple technical cores, particularly where the structure of the organization separates units that must coordinate to produce identifiable products and services and where different professions, crafts, and supervision are common.

Bundles of comparatively independent units can be linked together under a common administrative umbrella where routine administrative duties are delegated to machine bureaucracies. These professional bureaucracies operate well if each unit contributes its own outputs and the collection of unit outputs constitutes the systems output. The classic example is the university where students merely accumulate sufficient credit hours for graduation. Unfortunately, universities are typically unable to coordinate action across academic units.

Quasi-market mechanisms may be used to substitute for the discipline of the market itself. Unfortunately, bureaucratic based rewards and sanctions are often a poor substitute simply because they will not allow an offending unit to die. Much of the work cited earlier on strategic alliances and organizational networks appears to reflect the needs of business to develop quasi-market mechanisms to more quickly and effectively respond to market and technological changes.

Power and Control Dynamics within Complex Organizations. Generally it is expected that the market will eliminate organizations that over-grow their capability to coordinate and control actions. However, there may be compelling social, political, or defense reasons for developing huge organizations with multiple technical cores in defiance of market logic (e.g., Meyer, 1988)

Organizations are hierarchies. Individuals in positions of power and influence toward the top of the pyramid wield more influence primarily because organizational rationality suggests that they are needed for control and coordination and to develop the systems for control and coordination. Without either an organizational or market mechanism providing feedback, units are likely to drift, repeat once apparently successful routines, and/or degenerate to serve member interests.

The standard solution has been the bureaucracy -- the system designed to repeat operations, coordinate through rules, policies and procedures, and control via the hierarchy.

However, bureaucracies operate best in routine, predictable environments or under crisis conditions where the focus of activity is clear.

Where the rules, policies, and procedures failed, upper and senior managers have been asked to intervene either personally, using their positional authority, or systemically, by developing new rules, policies and procedures. As long as the technical underpinning and environment surrounding the organization are stable and predictable, such interventions appear to suffice.

Under conditions of more dramatic change and without the direct discipline of the market, bureaucracies become overly complex. Thus, there is a concern for learning, innovation and alliance development within the private sector. In different terms, senior managers are attempting to reassert their influence directly or indirectly to provide sufficient coherence to the system.

The chief difficulty is that the power and control dynamics within organizations are hierarchically bound. Senior managers are not disinterested parties but participants in the system. They will serve their own interests and may well delude themselves into believing that they have or should have more power and control than they do (the illusion of control).

Power/dependence views (e.g., Pfeffer & Salancik, 1988) place maximal weight on the development and use of power at or near the top of the organization. Stratified systems theory emphasizes the complexity of the tasks senior managers have often created for themselves and their subordinates. These analyses need to be combined with those of social construction and negotiated orders to encompass a broader range of individual interests.

The complex nexus of relationships among (1) senior management interests, (2) the coherence needs of their organizations, and (3) the alternative mechanisms for developing quasi-markets, organizational learning, and innovation needs to be more systematically examined. The development of organizations and mechanisms within organizations to provide sufficient power and control under dynamic environmental and technological conditions is one of the most challenging issues facing organizations in the 1990s. While the integrated model posits the need for more work on power and control, it fails at this stage to provide solid answers.

The Role of Different Causal Mechanisms

The proposed integrated model is extremely complex because organizations are extremely complex systems. It is possible to reexamine the proposed integrated view by reviewing the role of different causal mechanisms.

The Role of Rationality. There is little question that organizations can be viewed as purposive systems or machines used for goal attainment. Until the 1980's much of the work in organizational analysis stressed this perspective. The open systems view, stratified systems

theory, population ecology, transaction cost theory, and much of the strategic choice literature emphasizes this logic. When explaining and predicting survival, particularly for collections of organizations, reliance upon rationality appears to help chart broad patterns of adequate design within nation states. It is also particularly useful for smaller, less complex organizations with a single dominant technology and a single dominant product.

A purposive approach also is quite beneficial in charting many of the existing demands, constraints and opportunities facing an organization. It can be used to incorporate some key aspects of what have been labeled emergent processes. However, the purposive approach become less useful for huge organizations with multiple technologies and products. It also has limitations for charting new alternatives, explaining variation across nation states and cultures, predicting the strategic choices by senior managers and analyzing organizational dynamics.

The Role of Power and Control. Perhaps the most central feature of organizations is that they are hierarchical. While it is possible to evoke purposive arguments to support this feature (organizations need to be hierarchical to reach goals), the centrality of hierarchy can skew the entire theoretical framework to the point of misstating the importance of various types of actors.

One of the more dysfunctional aspects of a power and control approach, often found in the business press, attributes organizational rationality to the actions of power holders and reiterates their need to "control" subordinated departments and units as disinterested individuals. These analyses often appear to contradict a more fundamental understanding of individuals and their actions when in positions of nominal power and control. Elevating an individual to a high organizational position does not transform the individual into a fundamentally different type of person. Individuals are not smarter, taller, live longer, or magically have more insightful simply because they have senior management positions.

The more appropriate analyses of power and control in very complex organizations appear to show the discrepancies among the demands of traditional hierarchical designs and the abilities and interests of executives. A linear extension of comparatively simple designs for comparatively simple organizations to huge, multifaceted, multicultural organizations simply overloads senior management. They cannot control subordinate operations. They have comparatively little influence over even strategic direction as these complex systems simply do not respond well to a simple directive. Instead, analyses of power and control in more complex organizations should incorporate a more realistic picture of executive interests and incorporate how various mechanisms to enhance power and control influence both organizational goal attainment and senior executives.

Further institutional explanations need to be incorporated. For instance, institutional theory suggests that executives need to project the sense that they are powerful and in control even when they are not. While this need may be attributed to the personalities of the executives, it also appears to be a central expectation of very complex systems. The sense

that someone understands the larger picture allows individuals to concentrate on their tasks and provides the organization with a mechanism to circumvent the bounded rationality of individuals. Designing organizations to account for the bounded rationality and self-interests of executives, as well as providing the appearance of power and control, might appear to contradict a purposive approach. And it very well might.

The central point, however, should be clear. The design of the organizations should reflect the needs, desires, limitations and foibles of individuals. The organization is not just a machine.

The Enhancement of Individuals. For some time in organizational analysis there has been the notion that organizations need to serve others, efficiently produce and export more than they input even at the potential sacrifice of members. In a very strange turn of events, non-managers are considered costs: human resources on contract labor that desires as much remuneration as possible. Management, who is expected not to have these mundane personal goals, is expected to extract as much output as possible from the reluctant non-managers. Debate over the human nature of workers is still quite common.

Here, organizations are viewed as the dominant institution in our society. Individuals participate in organizations in a wide variety of ways and expect these institutions to provide a wide variety of goods and services. Organizations are not separate and distinct from the large society but part of it. Thus, institutional analysis and consistency with external expectations play a large role in organizational design.

As the predominate institution in the society, individuals are expected to use and be used by organizations to learn, innovate, provide meaning to life, and cope with reality. Just as executive interests may be congruent, incongruent and/or disconnected with organizational rationality, so might the interests of non-managerial participants. Thus, just as the creation of realities, rationalization of behaviors, and the negotiation of desired conditions is important to executives, so too are these important to all members.

While the reader may or may not agree with this heavily valued series of assumptions, one point seems clear. Analyses that do not recognize emergent processes and institutional pressures often fail to explain or predict adequately. To emphasize these rational notions, it appears useful to provide a metaphorical view of the proposed integrated model.

A METAPHORICAL EXPLANATION OF A PROPOSED INTEGRATIVE MODEL

The organization may be viewed as a feudal mosaic of interests immersed in an institutional sea. The organizational design of the system is the emergent pattern of relationships among individuals and their units within a specific context and an intended pattern of specialization. While a feudal system must appear to export more than it imports, its participants seek to exchange their time, energy and effort for financial, personal and social

rewards. This series of metaphors is intended to highlight a limited number of organizational characteristics that might get lost in the more detailed analytical views.

The Importance of Hierarchy

Again it is important to stress that organizations are hierarchically arranged with a pattern of vertical specialization and control. Power is not spread evenly throughout the system. Some individuals have higher pay, status and influence than others. Thus, even in a democracy such as ours, its major social institutions resemble the old feudal state. As in the feudal system, the power of the king is limited by other kings, the larger capabilities and constraints of the society, and obligations/inducements to members. As Chester Barnard noted over fifty years ago, individual power may appear to flow down the organization, but it is acceptance of direction that allows the organization to operate.

The Mosaic of Interests. The organization is said to resemble a mosaic of interests. It has several patterns of horizontal specialization and control. This image is used to (a) counter the images of a unified vertically structured hierarchy, (b) emphasize the diversity of demands, constraints and opportunities contained within organizations of any magnitude and (c) suggest that any definition of organizational boundaries artificially limits the analysis of these systems. For instance, deciding where any particular organization stops and another begins is as problematical as deciding what part of an employee belongs to the organization.

Different mosaics may be defined in quite different ways. It is meaningful to identify separate technologies, distinguish between lower, middle and senior management on the bases of their assigned duties, or separate line from staff functions. A most common and useful way for the uninitiated is to isolate the pattern of horizontal specialization and the patterns of coordination at each organizational level. The more experienced researchers realize that who is asked and how they are asked to describe their part of the organization is particularly important. Each member may attempt to create his/her own reality and negotiate an order that is personally acceptable.

Each method of dividing the organization provides a slightly different view of its parts and yet fails to highlight the overall patterns among the pieces. Each mosaic is itself composed of other mosaics. As each method of division is introduced, it is necessary to seek the countervailing mechanisms used to link the mosaics. Are senior, middle and lower level managements linked together? If so, how are these linkages established and what implications do different patterns of linkage have for criteria of interest?

The definition of the mosaic may be determined by the analyst and/or the analyst may attempt to isolate the patterns participants identify. There is no particular reason to believe that all the assigned categories will be identical to those that emerge from member experience. Some may be highly similar but assigned quite different roles and meanings by different participants. Some will be totally separate.

For instance, some organizational researchers are fond of asking managers and employees to identify the pattern of centralization/decentralization of decision making. One technique is to average the responses over a large number of decisions (see Scott, 1992). While this description may be meaningful to some analysts and managers, it may not make sense to participants. They may have a much more elaborate view of who makes what types of choices and how the character of the choice can be altered. Lower participants may reframe the choice so that the desired individual makes the selection among alternatives provided by the subordinate. In the literature, this example reflects the so-called "paradox of structure." At some point, the structure becomes so complex that subordinates actually have a choice among rules, policies and procedures and, therefore, structure the problem to fit the desired outcome.

Evoking the mosaic of interests also tends to remind senior managers of factors they already know but sometimes dismiss as implementation problems. Making choices and implementing them can be artificially separated. Astute strategists have long recognized that they should choose strategies that others can successfully implement.

Immersed in an Institutional Sea. The organization is said to be immersed in an institutional sea to represent the intricate relationships among the institutional environment (or socio-cultural, legal-political and economic setting in which a set of organizations operate, as within the U.S.), the design of the organization, and the outcomes of the organization. As institutional theory suggests, organizations absorb patterns of specialization, methods of control and coordination, and a whole host of goals from the larger institutional setting. Conversely, large organizations "pollute" the institutional setting by (a) legitimizing some societal expectations, (b) creating new expectations and (c) forcing individuals to use an organizational logic in their relationships on the job. For example, the organizational logic can rarely be confined to work relationships as the professions created within organizations are carried into the larger society.

This imagery also can be used to describe how organizations have become the dominant institution in ordinary life. The analyst need only examine how organizational practices are transferred into the larger society. For instance, consider the pressures and pulls on individuals from their careers, their families, their religion and their leisure. As the analyst moves up the organizational hierarchy (and one need not move up very far), it is obvious that organizational pulls and pressures begin to dominate for an increasing proportion of individuals.

Finally, the term immersion is used to stress the natural tendency of organization to drift. Organizations are only rational systems to rational actors. It takes enormous time, energy and effort to move an organization toward any goal.

Design as an Emergent Pattern of Relationships. While it is convenient to limit the view of organizational structure to the patterns of vertical specialization and control as well as horizontal specialization and coordination, such a simplistic view would ignore all the

important emergent processes that divide and unite the parts of the organization. The intended structure is not the design of the organization. While designers may wish to view the organization as a machine, in practice it is not.

Implicitly or explicitly, the design of the organization includes relevant portions of the context. Specifically, size and technological factors have a substantial influence not only on how designers intend to structure the organization but also how participants do their jobs.

The intended structure by designers is also an important, if not one of the most important, influence on the pattern of relationships. However, the intended pattern and the pattern in place are not always identical. For instance, an intended pattern of specialization of work horizontally and vertically is, in one sense, a substitute for leadership (organization of work by the commander), the culture (an evolutionary pattern of division of labor), and a well developed strategy (a plan detailing what is to be accomplished by whom in what manner). By following the intended patterns, people perform their duties (roles) and the collective efforts are expected to mesh as if leadership, culture, and strategy were comparatively unimportant. They are not. Each is infused into the fabric of the organizational experience whether the leader is active, passive, directive or inspirational, whether the culture is shaped or attacked by top management, and whether the strategy is good, poor or emergent.

In sum, the modern organization is complex. Studies of organizational design need to reflect the complexity of this societal creation. And this complexity is compounded when attempting to analyze organizational dynamics.

ORGANIZATIONAL DYNAMICS

The dynamics of organizations and organizational change have been studied from a wide variety of perspectives ranging from life-cycle models with predictable stages to so-called garbage can approaches that approximate a random walk through time. Chapter V discusses four important change issues likely to be of critical importance to organizations in the 1990s. These are retrenchment, learning, innovation, and strategic alliances/networks. This discussion highlights the need to understand which variables are changing and the capacity of the system to change.

Which Variables are Changing

There is a need to understand which variables or constellations of variables are undergoing evolution, change or dramatic reconfiguration. There is little question, for instance, that globalization is a new fact of life for many businesses. In conceptual terms, the institutional setting and task environments are being reconfigured. (See appendix A concerning the research topics recommended by scholars.) To compound this change, organizations are facing unparalleled alterations in their technologies as competitors improve and seek to improve their own competitiveness. The rate of change is becoming so rapid that

several scholars stressed the need to study organizational alliances and networks as organizations reconfigure into different types of entities.

In a similar vein, retrenchment (changes in both environmental munificence and reductions in size) are calling on organizations to alter their structures. These externally induced changes appear to have placed quite unusual pressures on the ability of organizations to change their structures rapidly. Several scholars noted that there may be fundamental alterations in emergent processes. And several called on management to devise new strategies.

In different terms, it is possible to identify some key variables that are dramatically changing and some that are being fundamentally altered. Here, analysis of radical change is needed. The consequences of these changes on the dynamics between, by, and within organization could then be plotted. Research should seek to ascertain (1) natural reactions of and within most organizations and the accompanying outcome implications, (2) the types of actions organizations are proactively taking to manage these changes and the outcome consequences associated with their coping strategies, and (3) the movement toward new organizations and new configurations of existing organizations to cope with fundamental change.

It is quite obvious that not all changes or all reactions could be ascertained in any one study. And the focus of investigation might well concentrated on specific types of outcomes. Still, broad research programs emphasizing change over time with multiple methods would appear to be warranted.

Understanding of Systems Capability for Change

It is important to frame analyses of organizational dynamics within (1) an historical context, (2) a general sense of what is needed and (3) the existing capacity of particular types of organizations to change.

The Importance of History and Historical Interpretation. The historical context is important for a variety of reasons. Two appear to be particularly important. The first is the natural tendency of organizations to continue as is. The second deals with interpretations of success or failure.

Except in the population ecology approaches, the role of inertial forces is downplayed in many analyses. Organizations that survive are selected in and tend to repeat their actions until they are selected out. The emergent process of organizations appear remarkably stable over time. Alterations in the context are comparatively rare, as organizations rarely alter their core technologies. Dramatic changes in size are often avoided. As the literature on retrenchment illustrates, downsizing is a wrenching process in organizations.

Inappropriate interpretations of prior success may mean that organizations deemed successful may be more resistant to change than ones with a history of difficulty. Starbuck and Milliken (1987), for instance, argue that a record of prior success may be seen as (1) leading to future success via replication, (2) leading to future failure via hubris, or (3) disassociated with future success because conditions have changed. In a similar fashion, failure may be seen as (1) yielding future success via corrective action, (2) associated with future failure via unbridled experimentation, or (3) unrelated to future success. In their analyses of disasters, few managers appeared to recognize the need to reconceptualize the determinants of success under changed conditions (prior and future success were related). And few participants realize that there is a tendency to "improve" old routines until there is failure. Even fewer recognized that a steady stream of improvements in specific areas might yield a larger systems failure.

The Desired End State. An analysis of organizational dynamics often benefits from some general idea of the desired end state for the organization. Then the analyst can work back using organizational rationality to plot the desired outcomes and the organizational structures and context needed for such a desired state. It is expected that change problems will occur. The analyst can often focus on how alterations might be made in the organization's leadership, culture, negotiated orders, or other emergent processes.

While such an approach is common for short term evolutionary changes, it has severe limitations for analysis of fundamental change. The organization itself may be so altered that it is not recognizable. Few scholars have such a clear view of the future that they can clearly articulate the new desired state. And, finally, emergent process are not only responsive to environmental, contextual and structural changes but also alter these variables.

Capacity to Adapt. The capacity of the system to adapt may partially be a function of its history and the interpretations of history, but it may also include the internal slack needed for experimentation. Standard economic analyses of organizations that emphasize efficiency often target slack for elimination. Yet, organizational slack may well suggest a capacity to adapt.

Existing work suggests that organizations may store some excess capacity. It is also quite possible that organizations may contain heretofore unrecognized adaptation capacities. The ability to mimic other organizations without understanding causal relationships, the potential for individuals to retrain themselves, and the ability of senior managers to reconfigure organizational interrelationships all appear to be potentially important unrecognized sources of slack.

Again, it is recognized that no one study can possibly represent a variety of organizational histories, a full range of interpretations, or extensive variety on the capabilities of organizations. However, in studying organizational dynamics these issues need to be included.

Systematic Analysis of Change Issues

The static model of organizations can be augmented to incorporate the types and rates of change in specific variables as well as the history and capabilities of the organization. Plotting the nature of the system before and after the change is quite helpful to identify those systems that successfully make the transition.

Another approach is to study change processes. It is the general expectation that organizations of the future will need to improve their ability to learn, innovate, and adopt new interorganizational relations.

Analysis of the causal mechanisms underlying the proposed integrative model combined with the change issues already identified by scholars yield a series of initial questions for a proposed research agenda.

APPLICABILITY OF THE PROPOSED FRAMEWORK TO NEEDED RESEARCH

The generation of a research agenda from the integrated model alone and in combination with the change issues identified from the current research is presented below. A listing of the topics and a package of research packages will be contained in a subsequent report. Part One of this discussion highlights the static and dynamic research questions emanating from the proposed framework. Part Two mentions research needed on key change issues and Part Three provides an overview of the causal dynamics in the proposed model in comparison to dominant themes in the change issues.

Research Following the Proposed Integrative Model

While the proposed integrative model is quite tentative, it attempts to categorize major variables and causal mechanisms that have played an important role in organizational analysis. Perhaps the most important element of the proposed model and that of many others in the field is the identification and analysis of organizational fit.

It is important to understand what general configurations are sufficient to provide for organizational survival. Following on this line of research, the more successful configuration patterns for specific types of organizational outcomes should be identified. While it may not be possible to identify a sufficient sample of organizations with requisite variety on all dimensions, it is important to at least have some representation of differences in environment, content, structure and emergent processes.

Analysis of organizational dynamics should focus on those variables and elements that are dramatically altering organizations. Further, such analyses should proceed to analyze dynamics under rational, institutional, power/control, and negotiated order logics to more fully understand when, where, how, and how long it takes for organizations to adapt to fundamental change.

FIGURE 3
**EXAMPLE CAUSAL FACTORS AND CHANGE ISSUES DOMINANT,
 IMPORTANT AND RARE EMPHASES IN THE EXISTING LITERATURE**

	Retrenchment	Learning	Innovation	Alliances
<u>Static Model Factors</u>				
Rationality	Dominant	Rare	Dominant	Important
Power/Control	Important	Rare	Rare	Important
Member Enhancement	Important	Dominant	Rare	Rare
Institutionalization	Rare	Rare	Important	Rare

Research Following Potentially Important Change Issues. Chapter V of this report identifies four key issues of considerable concern to researchers in the 1990s. The questions of retrenchment, innovation, learning, and strategic alliances are all of apparent critical importance to organizations in the 1990s.

The types of research needed in each of these areas are provided in Chapter V and will not be repeated here. It is sufficient to say that analyses of these dynamics will provide important insights into the design of high performing organizations.

Causal Factors and Change Mechanisms. Figure 3 shows a graphic representation of the types of causal mechanisms dominant in the proposed integrative model with the change issues identified in Chapter V. The boxes in the graph list the extent to which a particular causal mechanism is dominant, important or rare in analyses of the change issues.

Four causal mechanisms are highlighted in Figure 3. Rationality represents the assumed need for organizational rationality, goal attainment and survival in organizations. This view is heavily represented in systems, population ecology and organizational economics views of organizations. Power/control as a causal mechanism centers on the hierarchical nature of organizations and the tendency of complex organizations to follow the desires of senior management. Member enhancement focuses on the emergent processes in organizations (e.g., leadership, culture) and emphasizes the meanings individuals attempt to negotiate in organizations. Finally, the institutionalization mechanism helps highlight the absorption of solutions by organizations simply because they are used by others and legitimized.

- **Research on Retrenchment.** Research in retrenchment is quite varied and across all studies includes a consideration of three dominant causal factors in the integrative model. However, the analysis of retrenchment itself presumes that the system needs to reduce its size to increase productivity and/or survive. Most studies begin with this assumption and then work to identify better methods, the effects on stayers, and the types of designs that result from reductions. It is often presumed that senior management is in control of such slimming efforts but analyses rarely mention the need to substantially reduce senior management, cut their salaries, or place them on part-time status.

It is important to note that the current studies of downsizing rarely consider the institutional environment or institutional factors. Some literature on Japanese organizations suggests that before senior management cuts employees or employee wages, first it cuts its own salary and benefits. It might be particularly interesting to study how organizations in different institutional settings reduce scope and to examine cutting from the top down rather than from the bottom up.

Also missing from the downsizing literature are institutional explanations. As noted in the review, little or any empirical information is available on whether the systems are more or less productive after shrinking. Perhaps the predominant response by organizations in tough

economic times is to reduce employees, lower and middle managers (but rarely senior managers) much the same way others do it.

- **Research on Organizational Learning.** Organizational learning research is comparatively new and dominated by individually based models and approaches. As this area expands, it needs to begin incorporating rational, power/control, and institutional explanations for learning. It is presumed that organizations need to learn, but what do they need to learn and why? Is it possible that an organization learns the wrong things for its growth, survival and efficiency? Do organizations learn what senior managers and individuals in positions of power want it to learn? Do segments of the organization learn what they believe they should know? Perhaps a key challenge in organizations is for senior managers to switch from a managerial (power and control) logic to one that facilitates learning. Perhaps the high performing organization of the future will be more characterized by emphasis on horizontal and upward relationships than on command and control.

If learning is very heavily based in culture, to what extent do cultural boundaries limit the lessons that can be learned from experience? To what extent do organizations learn what others have learned? To what extent is organizational learning informed by the experimentation of others versus the random acceptance of others' actions? Is it possible the cognitive underpinnings of organizational learning limit the ability of the organization to take risks, embark on radically new programs or efficiently mimic others? Perhaps the learning sequence present in some organizations is inverse; they may act and then justify via a learning explanation.

- **Research on Innovation.** If organizational learning research emphasizes employee enhancement, it is often missing in studies of innovation. Instead, resistance to change in the implementation of an innovation is often mentioned as a major problem. Much of the work seeks to devise approaches to enhance the innovative potential of individuals through rewards, structures, champions and the like. Perhaps just the opposite should be examined. Why are individuals so innovative when off work and not so during working hours? What are the natures of the negotiated orders that preclude and eliminate experimental adoption? What inhibiting roles do strategy, culture and learning play in cutting the effective innovation rate?

In much of the rationally based innovation literature, there is the call for top management support as if senior managers had to be told that to stagnate in a dynamic environment is to die. Innovation, experimentation, and the structural recommendations to support these initiatives appear to run counter to the power/control dynamics presumed to be sought by senior management. Is this the case or is the very complexity of the organization a major block to innovation?

- **Research on Alliances.** While research on the evolution and development of strategic alliances and networks is also comparatively new, too few studies emphasize member enhancement or power/control explanations. Perhaps a major reason so many joint ventures

fail is simply because they cannot be structured even minimally to satisfy employees. For instance, turnover among joint venture general managers is extremely high; personal discussion with some of these managers suggests burn-out, divided loyalties, and lack of cultural support. Perhaps major lessons for designing high performance organizations might come from an analysis of the emergent systems in the strange new entities.

On a similar vein, it appears quite possible that the evolution of some strategic alliances may be mainly based on a power/control logic. Perhaps some are established to meet desires by senior management for international status, industry leadership, and contacts with fellow senior managers. While these reasons may appear very self-serving for senior managers, alliances may also promote learning and innovation by exposing members to new ideas and solutions.

It is also obvious that analysis of alliances needs to incorporate insights from studying learning, innovation, and retrenchment. Some studies of alliances are already noting the importance of learning, but they have yet to incorporate employee enhancement into their analyses. Clearly the time is passing where each of the isolated areas can be studied independently. Coordinated research linking all four with several different causal mechanisms is needed.

While it is possible to provide a much more elaborate list of needed work (for instance by incorporating needed work at different units of analysis), the picture should be clear. The trajectory of current work can be altered by systematically (1) studying more integrative models, (2) incorporating large scale dynamics and (3) emphasizing causal factors in change areas that are not well represented in the literature.

SUMMARY

This chapter presents an integrated model of organizations as a starting point for future research. The first two sections provide a static approach while the third section discusses dynamics. The final section of the chapter presents some research notions consistent with the model to illustrate its potential.

In the static view, analytical, graphical and metaphorical approaches are used to describe the model. It is complex since organizations are complex. Based on a rational systems view, the key variables are described and the primary mechanisms for survival are outlined in a discussion of fit. Then additional causal mechanisms are added to incorporate member enhancement, institutionalization, and power/control.

The metaphorical statement of the model emphasizes the importance of hierarchy, the mosaic of interests, the immersion of organizations in institutional settings and the design as an emergent pattern of relationships. The metaphorical treatment leads to the discussion of organizational dynamics.

This discussion builds on the Chapter V treatment of retrenchment, learning, innovation, and alliances by discussing the variables that are changing and the capability for change. The chapter closes by applying the four primary causal mechanisms in the proposed model (rationality, institutionalization, member enhancement and power/control) to current research in the four change areas. This discussion highlights needed integrative research in moving toward the development of an organizational design for high performing systems.

CHAPTER VII

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CHAPTER VIII

ANNOTATED BIBLIOGRAPHY OF SOURCES FROM THE COMPUTERIZED LITERATURE SEARCH

Adams, J. "Trade and Payments as Instituted Process: The Institutional Theory of the External Sector." *Journal of Economic Issues*, vol. 21, no. 4. Dec. 1987

A theory of external trade and payments based on the concepts of institutional economies should have characteristics and implications that are very different from those of orthodox theory, which is concerned almost totally with explaining economic relations among countries operating in a largely interlocked global market environment. This is because institutional theory must encompass all types of historically known economic exchanges among different social units. An axiomatic skeleton of a proposed institutional theory is developed and is illustrated by applying it to some problems and cases. Some hypotheses derived from the institutional theory include: 1. The more similar any 2 societies exchange institutions are, the more intensively they will trade together. 2. The more divergent societies exchange systems are, the more difficult it is to arrange trade. 3. As more societies trade systems become similar, world trade expands more quickly. 4. To have increased intersocial transactions, a country must bring its exchange practices into harmony with prevalent policies.

Aldrich, H. and Auster, E.R. "Even Dwarfs Started Small: Liabilities of Age and Size and Their Strategic Implications." *Research in Organizational Behavior*, vol. 8, pp. 165-198. 1986

This paper links the organizational ecology and business strategy literatures by focusing on liabilities of age and size and their strategic implications. This first section discusses external and internal liabilities associated with age and size. We argue that the strengths of large, old organizations are often the weaknesses of small, new organizations and vice versa. The second section of the paper considers population-level and organizational-level strategic implications of liabilities of age and size. Loose coupling strategies such as subcontracting, and franchising and emulation strategies such as corporate entrepreneurship are examined. At the population level, these strategies create new forms which may improve the viability of whole populations of organizations. At the organizational level these strategies may help larger, older organizations and newer, smaller organizations compensate for their weaknesses.

Ansoff, H.I. "Strategic Management of Technology." *Journal of Business Strategy*, vol. 7, no. 3. Winter 1987

As the high-technology industry matures, successful companies will be those that revise their strategies from emphasis on the proliferation of technology-driven products to strategies that emphasize: 1. controlling the rate of technological advances, 2. segmenting the markets according to customer needs, and 3. designing products to meet those needs. One success strategy is to reduce the frequency of product innovation and to concentrate on product improvements that reflect market needs. When new technologies enter the market, firms that have been successful in the past typically cannot transfer their capabilities, skills, and management to the new technology. In order to make the transition, companies can implement a number of competence-enhancing measures. Some of these include: 1. broadening the forecasting and information systems, 2. analyzing the firm's possible success and selecting future strategies, 3. enlarging research and development budgets to include strategic budgets, and 4. changing the organizational structure to provide for flexible responses to changes.

Appelbaum, S.H., Simpson, R., and Shapiro, B.T. "The Tough Test of Downsizing." *Organizational Dynamics*, vol. 16, no. 2. Autumn 1987

Downsizing is the systematic reduction of a workforce, usually as a result of financial losses, cash flow difficulties, or technological changes. Techniques used include hiring freezes, early retirement, transfers, and terminations. Downsizing steps include: 1. Develop a comprehensive plan and manage it. 2. Define the future organization. 3. Determine the affected group. 4. Identify which people will need placement. 5. Plan for staffing needs of the future organization. 6. Try to create placement opportunities. 7. Keep communication with employees open. 8. Allow reasonable time for employees to find employment elsewhere. 9. Terminate or lay off, if needed. 10. Provide for a healthy reduced organization. Before these 10 steps can be implemented, the human resources executive must formulate a strategic human resources model. The downsizing model includes problem recognition, strategic planning, preparatory actions, action plans, program components, communication and implementation, assistance to displaced persons, and follow-up.

Bahrami, H. and Evans, S. "Emerging Organizational Regimes in High Technology Firms: The Bi-Modal Form." *Human Resource Management*, vol. 28, no. 1. Spring 1989

Organizational regimes of high-technology companies need to accommodate a range of seemingly paradoxical imperatives, each requiring different structural emphasis. This has resulted in bi-modal organizational forms that are simultaneously centralized and decentralized. A 3-phase field study of 33 electronics firms in California between 1982 and 1987 provides data for describing the structural configurations of such firms at various stages of development. Stages in the evolution of the formal structure include the following: 1. simple, 2. functional, 3. quasi-divisional, 4. hybrid, and 5. group. The formal structures of the firms oscillate along the centralization-decentralization spectrum depending on the prevailing market conditions and priorities. Instead of embarking on perpetual modifications

of the formal structure, an organization can use novel technologies and management processes to strike a balance between the need for a stable structural anchor and the flexibility needed to address emerging imperatives.

Bahrami, H. and Evans, S. "Stratocracy in High-Technology Firms." *California Management Review*, vol. 30, no. 1, Fall 1987

Based on a 2-phased research study, "stratocracy," an organizational innovation pioneered by high-technology companies in California's Silicon Valley, is described. Phase one consisted of a cross-sectional survey of 15 firms in diverse technological arenas, and phase 2 was a longitudinal study of 2 firms that was undertaken in parallel. Stratocracy is an organizational regime of the high-technology area in which strategic ends change constantly and organizational means must be marshalled cohesively and be amenable to frequent adjustments. Because the doers are in a position to determine and undertake the actions needed for accomplishing the firm's changing ends and to rapidly refocus its capabilities, they are in charge. Stratocracy allows technological firms to keep sense of focus and cohesion and retain sufficient flexibility to cope with new imperatives. High-tech firms have hierarchical configurations and organizational arrangements that align the apex and the core in an attempt to unify strategic and operational command.

Bailey, G., Sherman, D., and Tomasko, R.M. "The Downside of Downsizing." *Management Review*, vol. 77, no. 4. April 1988

Downsizing may not always result in cost reductions. The true costs of downsizing include legal fees, company funds severance packages, early retirement programs, and outplacement services. Thus, there are several questions to ask to determine if downsizing is the right decision. If downsizing is elected, it must be planned carefully. The objectives of downsizing should be broader than just reducing the workforce. The best reference point for determining what the outcomes of downsizing should be is the company's strategic plan. A multi-industry study has shown that streamlined companies really do perform better.

Bailey, G. and Szerdy, J. "Is There Life After Downsizing?" *Journal of Business Strategy*, vol. 9, no. 1. Jan/Feb 1988

Companies can improve their chances of realizing their downsizing goals through organization balancing -- the practice of reviewing, analyzing, and stabilizing the organizational structure to ensure that the new environment supports new values and inhibits backsliding. Simplifying work processes, adjusting the staffing mix, and reinforcing new values are important. Following severe market fluctuations in 1985 and 1986, National Semiconductor Corp. pursued a program of downsizing that successfully lowered payroll costs and increased the firm's competitiveness. The company has established an in-house planning capability to ensure that strategy, structure, staffing, culture, and decision making are aligned. The company also has aimed to build flexibility into the organization, to balance technology, people, and process, and to institute programs that reinforce the new organizational values.

These programs include participative management and communications briefs.

Baranson, J. "Transnational Strategic Alliances: Why, What, Where and How." *Multinational Business*, no. 2. Summer 1990

Finding it necessary to diversify their product mix, upgrade their production technology, move to offshore procurement, or expand into overseas markets, firms are increasingly turning to transnational strategic alliances (TSA) to expand their commercial outreach in a manageable time frame without overextending managerial and financial limits. TSAs are an alternative to foreign investment in joint ventures. In the past, companies have viewed the technology sharing implicit in TSAs as an unpleasant but necessary condition for entering world markets. It is now time to think of this not as a necessary evil, but as a positive means for expanding roles in the global marketplace. In selecting a foreign partner, complementarity and compatibility of capabilities and intentions are essential.

Barley, S.R. "The Alignment of Technology and Structure Through Roles and Networks" *Administrative Science Quarterly*, vol. 35, no. 1. March 1990

A role-based approach is outlined for conceptualizing and investigating the contention in previous research that technologies change organizational and occupational structures by transforming patterns of action and interaction. Building on Nadel's (1957) theory of social structure, it is argued that the microsocial dynamics that result from new technologies reverberate up levels of analysis in an orderly manner. In particular, a technology's material attributes are said to have an immediate impact on the nonrelational elements, which eventually affect the structure of an organization's social networks. Consequently, roles and social networks are held to mediate a technology's structural effects. The theory is illustrated by ethnographic and sociometric data drawn from a comparative field study of the use of traditional and computerized imaging devices in 2 radiology departments.

Bell, B. "Two Separate Teams Should Be Set Up to Facilitate Strategic Alliances." *Journal of Business Strategy*, vol. 11, no. 6. Nov/Dec 1990

In order for strategic alliances to succeed, partners must take the time and make the effort to begin the work of business coordination. It is advisable to establish a partner-selection process that has 2 components that must operate simultaneously. First, a negotiation team must be developed that consists of financial executives, lawyers, and perhaps investment bankers. At the same time, a business transition team must be developed to work out the details of how and when the day-to-day operations of the partners will function in tandem. It is critical that both partners have the same view of the role of the negotiation team versus the business team. The negotiation team is accountable for agreeing on terms and conditions for operating as a partnership, whereas business team members can advise negotiators on reasonable parameters on which to negotiate.

Biggart, N.W. and Hamilton, G.G. "An Institutional Theory of Leadership." *Journal of Applied Behavioral Science*, vol. 23, no. 4. 1987

A theory of leadership based on Weberian sociology links leadership to the legitimating principles and norms of the social structure in which leadership occurs. The theory argues that leadership strategies must consider legitimating principles and the dominant structures of authority since leadership is a relationship among persons in a given social setting at a given historic moment. The theory embodies 4 hypotheses: 1. Leadership strategies in a certain sociocultural setting will have strong underlying similarities. 2. As an organization changes, its strategies of leadership also will change. 3. Organizations performing the same tasks based on different substantive principles will use different strategies of leadership. 4. Occupational and organizational subgroups based on distinctive norms will have similar leadership styles across organizations and will differ from other subgroups within a single organization. When building theories on leadership, theorists should take into account that strategies of leadership must consider the normative basis of the relationship and the setting, as well as the performance abilities of those involved.

Borys, B. and Jemison, D.B. "Hybrid Arrangements as Strategic Alliances: Theoretical Issues in Organizational Combinations." *Academy of Management Review*, vol. 14, no. 2. 1989

Hybrid organizational arrangements, in which two or more sovereign organizations combine to pursue common interests, raise significant questions for both scholars and managers. A review of previous research yields four key issues - breadth of purpose, boundary determination, value creation, and stability mechanisms - that form the core of a theory of hybrid arrangements. This theory is then used to generate researchable propositions that explore differences among types of hybrids and to offer insights for managers of hybrid organizations.

Bowersox, D.J. and Droge, C. "Similarities in the Organization and Practice of Logistics Management Among Manufacturers, Wholesalers and Retailers." *Journal of Business Logistics*, vol. 10, no. 2. 1989

A widely held belief has been that logistics management is primarily applicable to manufacturing. The analysis presented clearly substantiates that best organizational structure and logistics management practices are equally applicable to wholesalers and retailers. Ample evidence exists to support the conclusion that similarities in logistical practice tend to attract leading edge performers to innovative channel arrangements. The trend in the current practice of forming strategic channel alliances is speculated to have a significant impact upon future logistics organizational structure.

Bunning, R.L. "The Dynamics of Downsizing." *Personnel Journal*, vol. 69, no. 9. Sept. 1990

A 1988 survey of nearly 1,200 personnel managers showed that 35% of the respondents worked for companies that had downsized during the last 12 months. Of these companies, 30% were planning to further decrease the workforce in the following 12 months. Unionized firms were shown to have nearly 3 times the likelihood of downsizing as nonunionized firms. The effects of the downsizing are felt beyond the employees who lost their jobs; the remaining workforce is affected as well, and the marketplace's view of the company is often negative. In spite of the seriousness and difficulty of downsizing, a study showed that as many as 50% of personnel managers said that their company was unprepared to conduct a reduction in force (RIF). Management should be committed to reducing the workforce as quickly, humanely, and efficiently as possible and must show the highest level of ethics. Some of the criteria often used to select employees who will be terminated are: 1. tenure, 2. position and function, 3. employment status, and 4. work performance. It is increasingly common to provide job search training and support to exiting employees.

Bygrave, W.D. "The Entrepreneurship Paradigm (II): Chaos and Catastrophes Among Quantum Jumps?" *Entrepreneurship: Theory and Practice*, vol. 14, no. 2. Winter 1989

The entrepreneurship process is examined to determine whether any of its characteristics are amenable to the mathematics of catastrophe and chaos. Catastrophe theory was introduced by Thom in 1972 as a mathematical theory of systems that suddenly jump from one stable state to another. Chaos, a science of the electronic generation, was discovered by Lorenz in 1961. Three simple, but unsolvable, differential equations are examined to display chaos and to show how they can be set up as a model for the flows of venture capital. A simple, nonlinear difference equation is also examined to show that it can produce chaos in a population ecology model. In order to relate empirical findings to chaotic mathematical models, a regular pattern must be found in what appear to be irregular data. One of the most effective methods for accomplishing this is to plot a delayed time series against itself. In chaos, nonlinear systems, such as those that might be found in entrepreneurship, are potentially plagued with problems when attempts are made to predict future behavior. To understand entrepreneurship, research methodologies must be able to handle nonlinear, unstable discontinuities.

Carroll, G.R., Goodstein, J., and Gyenes, A. "Organizations and the State: Effects of the Institutional Environment on Agricultural Cooperatives in Hungary." *Administrative Science Quarterly*, vol. 33, no. 2. June 1988

Institutional theory is used to examine the ways in which the Hungarian state shapes the organizational structure and behavior of agricultural cooperatives. Fragmentation in the structure of state decision making is hypothesized as leading to: 1. more elaborate interorganizational networks, 2. greater competition among similar organizations, and 3. larger administrative components. Fragmentation was measured using both survey data from the managers of cooperatives, and county archival data. Analysis provides evidence supporting

the hypotheses about networks and competition but contradicting the hypotheses about administrative overhead. Although the two types of measures did not behave exactly the same way in all analyses, their performances were logically consistent.

Cohen, I. and Lachman, R. "The Generality of the Strategic Contingencies Approach to Sub-Unit Power." *Organization Studies*, vol. 9, no. 3. 1988

To test the generalizability of the strategic contingencies model of intraorganizational power (Hickson et al. 1971, Hinings et al. 1974) in small, reciprocal workflow, service organizations, 9 health care clinics of 3 subunits each (medical, paramedical, and administrative) are sampled. The clinics are part of a publicly owned health care organization in Israel. Data are collected through: 1. an extensive exploratory investigation, 2. structured interviews, 3. observations, and 4. analysis of organizational records. Variables include: 1. power, 2. coping with uncertainty, 3. centrality, 4. nonsubstitutability, and 5. professionalization. Results show that coping with uncertainty and pervasiveness of work relations are related substantially to power. When these 2 factors' effects are controlled, nonsubstitutability and professionalization have no significant net effect on power. Most of the findings are highly consistent with those obtained in larger and more complex organizations in North America.

Colignon, R. "Organizational Permeability in U.S. Social Service Agencies." *Organization Studies*, vol. 8, no. 2. 1987

The concept of organizational permeability is operationalized and examined in relation to environmental contingency and organizational design characteristics. This study indicates that environmental contingency and boundary permeability have differential and selective impact on characteristics of organizational design. The results suggest that there is a dynamic relationship between organizational design and interorganizational linkages as two alternative forms of adaption to environmental contingencies needing further research and theoretical elaboration.

Collins, P., Hage, J., and Hull, F.M. "Organizational and Technological Predictors of Change in Automaticity." *Academy of Management Journal*, vol. 31, no. 3. Sept. 1988

In order to develop a theory of change in automaticity that integrates both organization and technoeconomic approaches to process innovation, longitudinal data on 54 organizations were collected between 1973 and 1981 by the use of structured interviews, archival data, and field observation. Measures included change in production system development, organizational complexity, decentralization, and formalization. The results of regression analyses show that, from 1973 to 1981, organizations moved away from conventional hard automation to programmable automation. Those firms with more advance production systems in 1973 were less likely to automate further in the next 8 years, while firms with the lowest production levels showed the greatest increase in automaticity. The results of moderated regression

analysis also supported the hypothesis that structure and technology interact to affect change in automaticity.

Cody, A.M., Hegeman, G.B., and Shanks, D.C. "How to Reduce the Size of the Organization but Increase Effectiveness." *Journal of Business Strategy*, vol. 8, no. 1. Summer 1987

There are 2 extreme approaches to downsizing: 1. In an atmosphere of crisis, top management must make organizational changes quickly and with little participation from others. 2. Softer techniques involve substantial management and nonmanagement interaction and participation. Each of the extreme approaches has substantial shortcomings. A middle-ground approach enables substantial cost reductions while minimizing disruptions of important operations of the business. Such an approach is best for most firms seeking to streamline their organizations, particularly in cases in which staff reductions of 15%-20% over a one- to 2-year period are necessary. Planning for the intermediate approach requires 7 steps: 1. Review and Validate corporate goals and strategy. 2. Compare the organization with others in the industry, particularly those considered more efficient. 3. Assess the present organization. 4. Develop a vision statement that describes the foundation on which the organization must be built. 5. Outline alternative organizational designs. 6. Evaluate the alternatives and select a preferred option. 7. Develop a plan for implementing the reorganization.

Damanpour, F., Szabat, K., and Evan, W. "The Relationship Between Types of Innovation and Organizational Performance." *Journal of Management Studies*, vol. 26, no. 6. Nov. 1989

The relationship between the adoption of administrative and technical innovations over time and its impact on organizational performance was examined. Data were gathered from a sample of 85 public libraries in 6 northeast states in the US by mailing questionnaires to the directors of all public libraries serving a population of 50,000 or more. A confirmatory analysis showed that, over consecutive time periods, changes in the social structure, portrayed by the adoption of administrative innovations, lead to changes in the technical system, portrayed by the adoption of technical innovations. According to empirical findings, the hypothesis that technical innovations precede administrative innovations in the organizational change process may not necessarily be true in all conditions. The practical implication of Daft's (1982) framework for organizational innovation was illustrated by demonstrating its predictive ability to separate organizations based on their performance levels.

Daniell, M. "Webs We Weave." *Management Today*, pp. 81-86. Feb 1990

During the 1990s, the structure and operations of many companies in the UK will undergo fundamental changes. One victim of these changes will be the traditional "command and control" system, in which orders come down from an omnipotent corporate center to be executed by employees at lower levels. A second model that will become increasingly rare is decentralized management of the type that became popular in the 1960s. Strategic alliances will continue to be an important avenue for development. Increased geographic coverage, access to critical technology, and effective distribution are among the many benefits cited for

activity in this area. Organizations that adopt the "network model." which closely resembles the physical configuration of a modern integrated information systems network, can expect a radical shift in the structure and functioning of the corporation. Information will be more thoroughly processed and more widely available.

David, F.R., Randolph, W.A., and Pearce, J.A. III. "Linking Technology and Structure to Enhance Group Performance." *Journal of Applied Psychology*, vol. 74, no. 2. April 1989

Linkages between technology and structure were examined at the group level of analysis as predictors of group performance. It was hypothesized that group technology-structural fit is a better predictor of work group performance than either technology or structure alone. Related hypotheses match 3 technology variables - task predictability, problem analyzability, and interdependence - with 3 group structural variables - horizontal differentiation, vertical differentiation, and connectedness - to predict group performance. The research sample consisted of 221 managers employed in 10 departments, 2 from each of 5 large banks located in the southeastern US. The results suggest that group structural properties have a more significant impact on group performance than does group technology. The fit between group technology and group structural properties is also a useful predictor of group performance. Effectively matching technology and structure at the group level of analysis promises to benefit group interaction, communication, and performance.

Dearden, J., Ickes, B., and Samuelson, L. "To Innovate or Not to Innovate: Incentives and Innovation in Hierarchies." *American Economic Review*, vol. 80, no. 5. December 1990

The USSR consistently produces potentially valuable innovations but consistently fails to induce the use of these innovations. Hierarchical organizations often perform poorly in inducing the adoption of innovations. This issue is investigated by examining principal offering contracts to agents who make unobservable effort and adoption-of-innovation choices (yielding moral hazard), who occupy jobs of differing, unobserved productivities (yielding adverse selection), and who engage in a repeated to relationship with the principal (causing a ratchet effect to arise). It is shown that increasing the rate of adoption of an innovation in such an organization causes the incentive costs of adoption to rise at an increasing rate. Relatively low rates of adoption may then be a response to the prohibitive incentive costs of higher adoption rates.

Dichter, M.S. and Trank, M.A. "Learning to Manage Reductions-in-Force." *Management Review*, vol. 80, no. 3. March 1991

As the economic storm clouds gather, many businesses of all sizes are responding to competitive pressures and recession fears by trimming their workforces. The list of companies that have implemented substantial reductions in force, of RIFs, reads like a Who's Who of American Business: IBM, AT&T, Honeywell, Motorola, Citicorp, Martin Marietta, Aetna Life and Casualty, Unisys, Chesebrough-Ponds, Polaroid and the New York Stock Exchange are just a few examples. There are numerous ways to accomplish RIFs. Boiled

down to their basics, these approaches fall into two categories: voluntary and involuntary. The former includes financial inducements for voluntary separation and early retirement incentive packages, and the latter approach includes involuntary termination or layoffs. Each approach has its advantages and disadvantages.

Dunn, B.D. "Making the Most of Slow Growth." *Management Review*, vol. 80, no. 3. March 1991.

Typical managerial reactions to the economic slowdown have included hiring freezes, cuts in overhead, and across-the-board reductions in staff. The rationale for such drastic actions is that it is an expedient way to solve what is hoped to be a temporary problem. However, a company cannot afford to be overly reactionary every time there is a downturn in earnings. Drastic actions will create high levels of anxiety, as well as leave large gaps in management talents. Subsequently, management must be responsive to the realities of the current situation, while all along considering the long-term position and profitability of the organization. In addition, a company must continue to make opportunities available to its promising managers and to keep career paths from being filled with ineffective managers. Some ways that this can be achieved include: 1. providing professionally guided career life sessions, 2. offering part-time work, 3. promoting employee involvement in cost reduction, and 4. trading quality for quantity.

Eales, R. "Asea-Brown Boveri: Generating New Hope for Europe." *Multinational Business*, no. 4. Winter 1987

If it is to compete successfully with US and Japanese competition, European industry needs European domestic scale. Several factors signal that the \$4.9-billion merger of Asea, one of Europe's strongest electrical engineering companies, with the Swiss electrical engineer Brown Boveri, could be the successful strategic model for other European industries. These factors include: 1. an improved climate for corporate mergers and alliances, 2. both companies' goodwill, and 3. the reputation of Percy Barnevik, president and chief manufacturer of Asea, as a strategist and industrial restructurer. Asea has abandoned heavy engineering in favor of electrical engineering, but the main business of Brown Boveri remains power-generating plants and equipment. The 2 firms' business segments are similar and their markets are complementary. They intend to focus on technology, innovation, and quality; and their research and development investment, now at \$940 million a year, is expected to grow. Asea-Brown Boveri has set the pace for more restructuring of the heavy electrical industry in Europe.

Eisenhardt, K.M. "Agency and Institutional Theory Explanations: The Case of Retail Sales Compensation." *Academy of Management Journal*, vol. 31, no. 3. Sept. 1988

In order to determine when firms use salary compensation and when they use performance-based compensation, data were collected using both questionnaires and interviews from 54 specialty stores in a suburban Bay Area shopping center. The research design included

variables from both agency theory, which models the relationship between a principal who delegates work to an agent who performs the work, and institutional theory, which emphasizes the influence of organizational structure on practices and behavior. The main instrument used to obtain data was a questionnaire developed from interviews with retailers and retail salespeople, union business agents, and personnel specialists. Both models were tested using 2-group discriminant analysis. Results show that programmability of a job, span of control, uncertainty, type of merchandise, and age of a store chain are all significant predictors of compensation policy. Both agency and institutional theory provided a good description of compensation policies in this research setting, and both perspectives were seen to be complementary.

Feldman, D.C. "Careers in Organizations: Recent Trends and Future Directions." *Journal of Management*, vol. 15, no. 2. June 1989

The field of organizational behavior during the past 10 years has become more concerned with the careers of employees. Research conducted over this time period has focused on such issues as job stability, job exit, and resocialization within and across organizations. Theoretical approaches, such as the development perspective, stress/coping patterns, small group behavior research, attribution theory, and population ecology, were important methods in the study of careers. Research methods for the future should contain more longitudinal research and should focus more on the social and economic context of job entry and job transition. An examination of the implications of the careers area research shows that: 1. the individual is interested in the changing nature of employees' attitudes toward their careers and the consequences of those attitude changes on employee career decision making and self-management, and 2. the organization is concerned with the need to integrate organizational career development activities with other human resources activities and to tie all those activities more analytically to overall corporate strategic thinking.

Fligstein, N. and Dauber, K. "Structural Change in Corporate Organization." *Annual Review of Sociology*, vol. 15, pp. 73-96. 1989

The purpose of this review is to assess the adequacy of various economic and sociological explanations in accounting for certain key features of change in large-scale corporations, including vertical integration, product related and unrelated diversification, and the implementation of the multidivisional form. We first review the various economic theories that purport to explain these phenomena, including the structure-conduct-performance perspective, the literature on managerial discretion, transaction cost analysis, contingency theory, and the evolutionary theory of economic change. All of these literatures have efficiency mechanisms that drive their explanations although they work in different ways. We then consider sociological approaches including the literatures in organizational theory on institutionalization and power. Our review of the empirical work provides little support for the economic view of vertical integration and unrelated product diversification, and only modest support for the economic view of product-related diversification and the multidivisional form. The sociological views aid in understanding all of these phenomena to some

extent. We conclude by suggesting that the concept of organizational fields may be useful in understanding these structural changes.

Florida, R. and Kennedy, M. "Silicon Valley and Route 128 Won't Save Us." *California Management Review*, vol. 33, no. 1. Fall 1990

Most Americans regard Silicon Valley and Route 128 as symbols of the US' economic and technological success. These areas are held out as models for the rest of the US economy. However, their success is misleading. The reality of Silicon Valley and Route 128 is one of severe, at time devastating, competition that drastically limits the ability of small entrepreneurial firms to cooperate with one another and to generate follow-through on cutting-edge technological innovations. Most of the high-technology firms make little effort to develop permanent tight relationships with even their most valued suppliers. The US microelectronics industry is too fragmented; very few start-up firms ever become large enough to compete effectively in global markets. More important, because these firms have not been able to develop close working relationships with their customers, which are primarily traditional manufacturing firms, the latter continue to slip further behind. The innovations of the US' high-tech firms are not being diffused throughout the rest of the US economy.

Forrest, J.E. "Strategic Alliances and the Small Technology Based Firm." *Journal of Small Business Management*, vol. 28, no. 3. Jul 1990

In order to develop and sustain their technological competitiveness and to facilitate the rapid exploitation of their technologies, small technology-based firms (STBF) can use a variety of strategies. One such strategy involves the formation of strategic alliances. Certain alliances, such as university research institute agreements, client sponsored agreements, collaborative research and development agreements, inward technology licensing, and the formation of research and development limited partnerships can be used by the STBF to effectively develop and sustain its technological competitiveness. Alliances, such as manufacturing, marketing--distribution alliances, and outward technology licensing, enable firms to more quickly exploit their technological leadership. If care is taken in choosing a partner, negotiating the alliance, developing the alliance agreement, and managing the alliance, such alliances can be successful.

Garner, L. "Managing Change Through Organization Structure." *Journal of State Government*, vol. 60, no. 4. July-Aug. 1987.

Florida's reorganization of human services delivery is an example of how changing government structure did not change government operations for the better. In 1985, complaints about Florida's Department of Health and Rehabilitative Services (HRS) reached a peak when a series of grand jury investigations concluded that the HRS lacked management and services integration and suffered from poor casework. Explanations of the reasons that HRS's reorganization did not work are: 1. Integration of services is a difficult task. 2. Service integration was attempted at a time when demand often increased faster than resources. 3.

There was a lasting split between the operations staff and the program offices. 4. HRS lacked a unifying decision support system. Some hypotheses that can be drawn from Florida's experience are: 1. Changing government operations through organization structure is a very difficult task. 2. Complex problems do not require complex organization structures. 3. Control of the decision-making process and monitoring systems is more effective than organization structure.

Garratt, B. "Learning is the Core of Organisational Survival: Action Learning is the Key Integrating Process." *Journal of Management Development*, vol. 6, no. 2. 1987

The central concept of action learning is that, for any organism to survive, its learning rate must be equal to or greater than the rate of change in its environment. Learning is recognized increasingly by the direction-givers of an organization as the main process by which the various functions of an enterprise achieve a unity of purpose. Learning also is becoming a commodity to be traded across departmental, corporate, and national boundaries. In the field of action learning 15 years ago, it was the norm to work with and through personnel and training managers. However, in discussing organizational learning processes publicly over the past 4 years, support has been received from such unlikely sources as lawyers and accountants. This support is due to the above learning rate formula and the necessity to value and be more rigorous at codifying and diffusing the knowledge, attitudes, and skills created by the organization during its normal work. An organization's people are its only resource capable of learning, and thus, top management has the key role as collectors and diffusers of the learning of their organization.

Gartner, William B. "Some Suggestions for Research on Entrepreneurial Traits and Characteristics." *Entrepreneurship: Theory & Practice*, vol. 14, no. 1. Fall 1989

This article suggests that researchers submitting manuscripts on entrepreneurial traits and characteristics should: ground their studies in the context of previous research, articulate a specific theory about the nature of entrepreneurship and its relationship to the entrepreneur, define key ideas and variables, conscientiously identify and select samples, and use current social psychology and personality theory-based measurement instruments or provide construct validity evidence for newly constructed measures.

Grosman, B.A. "Corporate Loyalty, Does It Have a Future?" *Journal of Business Ethics*, vol. 8, no. 7. July 1989

Promoting concepts of corporate family, employee participation, and euphemisms that stress employee-employer long-term continuity makes the loss of loyalty resulting from downsizings, mass firings, and corporate restructuring more difficult for employers and employees. This promotion of reciprocal obligations misleads employees and employers into a belief system that is to their mutual disadvantage. Unrealistic expectations can create hostility. If employment dislocation is viewed as a part of a continual economic evolution, the loss of employment is no longer an outrageous affront to employees' dignity but rather a normal

process of economic change and renewal. Simple steps to increase loyalty include: 1. the identification of the real trusted leaders in the corporation, 2. an understanding of why they exercise leadership and command respect, 3. open and honest communication of corporate goals, 4. the mutual definition of the corporation goals, and 5. living up to commitments. Heenan, D.A. "The Downside of Downsizing." *Journal of Business Strategy*, vol. 10, no. 6. Nov/Dec 1989

Restructuring has become a popular method for streamlining organizations. More than half of the Fortune 500 companies have slashed their corporate staff. Since 1979, over one million managerial and staff professional positions have been eliminated. With 10 years of downsizing experience, corporate managers have begun to assess its performance. They have found that there is widespread disenchantment with downsizing. An American Management Association survey of recently downsized companies found that nearly half of the companies are having major misgivings about their leaner organizations. Some of the most serious complaints are: 1. Staff services are inferior. 2. There is a loss of control. If a company is thinking about downsizing, there are several important factors to consider. These include: 1. Assess the commitment to downsizing. 2. Monitor costs closely. 3. Invest in people instead of computers.

Hoskisson, R. "Multidivisional Structure and Performance: The Contingency of Diversification Strategy." *Academy of Management Journal*, vol. 30, no. 4. Dec. 1987

The relationship between multidivisional (M-form) structure and performance is investigated. Theoretical research by Hill and Hoskisson (1987) has suggested that the connection between implementation of such a structure and performance should differ according to diversification strategy. In this study, a total of 62 firms identified by previous research as having undergone the transition to an M-form are examined -- including 24 vertically integrated, 22 related-diversified, and 16 unrelated-diversified firms. The main performance measure used in this study is a time series of return on assets over 21 years, including the decades both before and after the year of reorganization. Control variables include industry returns and innovation effects, and covariates are size, asset growth, percentage change in gross national product, and firm-trend residuals. Findings show that M-form implementation increased the rate of return for vertical integrators. The change was not significant for related diversifiers. Risk usually decreased after M-form restructuring, but this was only significant for unrelated-diversified and vertically integrated firms.

Howard, A. "Who Reaches for the Golden Handshake?" *Academy of Management Executive*, vol. 2, no. 2. May 1988

Workforce reductions sometimes are accompanied by early retirement financial incentives known as golden handshakes. A study of 148 managers in the Bell System telephone companies revealed no meaningful difference in overall job performance between those who retired and those who stayed. Retirement proneness could be identified in advance based on 3 traits: 1. lower work motivation, 2. financial feasibility of early retirement, and 3. greater interest in recreational and social activities. For most employees, retirement pursuant to a golden handshake was a positive experience. Recommendations include: 1. Retirement must be truly voluntary. 2. Performance appraisals should not be dramatically changed at the time of downsizing. 3. Early retirees should be made to feel appreciated at the time they leave. 4. Using retirees part-time or as consultants should be considered. 5. Do not use golden handshakes to rid the company of unresolved problems.

Johne, F.A. "Organising for High Technology Product Development." *Management Decision*, vol. 25, no. 6. 1987

A study of UK test instrument manufacturers was conducted to investigate the organizational arrangements used by firms that are regular product innovators. From analytical literature and discussions with industry experts, a schema was developed for categorizing differences in product innovation performance. Data for 8 "leader" firms and 8 "follower" firms were collected during interviews with people involved in product innovation tasks, including the firms' chief executive officers. The study's findings indicate that the industry leaders have a definite desire to lead the market through product innovation. Industry leaders spent an average of 3 times more money on research and development than did follower firms. Also, leader firms used a loose, brain-storming approach during the product initiation phase and a rigid formal approach during implementation of the new product. Follower firms used a formal approach during initiation and a single-department approach during implementation.

Koenig, C. and Thietart, R.A. "Technology and Organization: The Mutual Organization in the European Aerospace Industry." *International Studies of Management and Organization*, vol. 17, no. 4. Winter 1987/1988

The rapid development of strategic alliances raises new strategic and managerial issues. A study examined the characteristics of the mutual organization, a form of partnership between companies in which both parties and principals are cocontractors, by focusing on the European aerospace industry. This industry is characterized by high risk, large economies of scale, and experience effects. The high costs and high levels of economic and technical risk have induced manufacturers in this industry to form mutual organizations. Four different forms of mutual organizations are illustrated by 4 projects carried out by the European aircraft industry: 1. Airbus Industrie, 2. Concorde, 3. European Space Research Organization (ESRO), and 4. European Launcher Development Organization (ELDO). Although these projects seem to exhibit the same characteristics, they are actually very diverse at a micro-organizational

level. Airbus and ESRO, the more successful ventures, were comparable in terms of their organizational features and their adaptable management. Concorde and ELDO, which were less successful, featured centralization of decisions and internal politicking among managers.

Kram, K.E. and Hall D.T. "Mentoring as an Antidote to Stress During Corporate Trauma." *Human Resource Management*, vol. 28, no. 4. Winter 1989

Mentoring as a potentially useful resource in an organization's adaptation to global competition and the need for improved learning capabilities are examined. It is found, surprisingly, that mentoring relationships were perceived as more desirable under conditions of corporate stress, low job challenge, and low job involvement. Further, it was likely, or more likely than, their midcareer colleagues to embrace the mentoring role. Thus, it appears that mentoring may be more readily available as an antidote to stress than previously considered and that it may be an important form of coping with the stressful, nonrewarding conditions that typically characterize corporate downsizing. Not only is mentoring an important form of promoting development, but it also may represent a valuable vehicle for social support and learning during times of major corporate change.

Lambkin, M. "Order of Entry and Performance in New Markets." *Strategic Management Journal*, vol. 9. Summer 1988

Both academics and management practitioners hold the belief that early entrants into newly developing markets enjoy an enduring competitive advantage over later entrants. A study tested this belief by comparing the behavior and performance of 3 entrant categories: 1. pioneers, 2. early followers, 3. late entrants. A population ecology model and data on start-up and adolescent businesses from the Profit Impact Marketing Strategy database were used for the analysis. The results of the analysis support the hypothesis that pioneers enjoy a long-term profit advantage over their rivals. Evidence suggests, however, that this high return is necessary to compensate for the large investment pioneers must make to develop new markets. Although early followers and late entrants do not differ much initially, during the adolescent stage, the early followers show significant advantages over late entrants in both market share and profitability.

Lawrence, A.T. and Mittman, B.S. "What Kind of Downsizer Are You?" *Management Review*, vol. 80, no. 1. Jan 1991

Fully 36% of firms responding to the American Management Association's (AMA) 1990 survey reported another round of workforce reductions within the past year; 15% expect more cutbacks within the coming year. An analysis of the survey results identified 3 distinctive approaches to workforce reduction: 1. preventionists, which are more likely to be motivated by an economic downturn and tend to be medium-size firms, 2. people pushers, which are firms that try to push people out of surplus jobs by offering various incentives, and 3. parachute packers, which are companies that lay off employees but give enough severance pay and extended health benefits to get rid of them gently.

Levitt, B. and March, J.G. "Organizational Learning." *Annual Review of Sociology*, vol. 14, pp. 319-340. 1988

This paper reviews the literature on organizational learning. Organizational learning is viewed as routine-based, history-dependent, and target-oriented. Organizations are seen as learning by encoding inferences from history into routines that guide behavior. Within this perspective on organizational learning, topics covered include how organizations learn from direct experience, how organizations learn from the experience of others, and how organizations develop conceptual frameworks or paradigms for interpreting that experience. The section on organizational memory discusses how organizations encode, store, and retrieve the lessons of history despite the turnover of personnel and the passage of time. Organizational learning is further complicated by the ecological structure of the simultaneously adapting behavior of other organizations, and by an endogenously changing environment. The final section discusses the limitations as well as the possibilities of organizational learning as a form of intelligence.

Lewis, J.D. "Competitive Alliances Redefine Companies." *Management Review*, vol. 80, no. 4. April 1991

Strategic alliances, which require distinct organizational practices, new job definitions, new ways of managing, and even a redefinition of the firm, may be the competitive weapon of the 1990s. How well a firm benefits from strategic alliances depends on how it works on the inside. The need for close cooperation with others imposes a distinct set of requirements on the firm. Among these are the need for substantial delegations and an unprecedented emphasis on organizational learning. Strategic alliances cannot function in companies with top-down management. In high-learning firms, part of every manager's job includes encouraging experimentation and helping people find better ways of doing things. Failure is tolerated in that it is expected to lead to new insights and add to the organization's knowledge. With half of its corporate earnings coming from joint ventures, Corning Glass Works may be the most successful alliance practitioner in the world. All Corning employees are required to receive 100 hours of formal training per year.

Liu, M., Denis, H., Kolodny, H., and Stymne, B. "Organization Design for Technological Change." *Human Relations*, vol. 43, no. 1. Jan. 1990

The microprocessor revolution is the leading edge of a new system of technology that underlies a new paradigm of work organization. Hypotheses concerning the content of this new paradigm include: 1. Work will be organized to regulate the unpredictable variances of complex, automated systems. 2. Organization will increasingly be concerned with open processes and with rules and procedures. 3. Organizations will be designed to manage complexity more than to reduce it. 4. Organization design will be based on conceptually new integrative approaches. 5. Organization designers will admit enlarged rationalities. Obstacles to be overcome are limits related to the development of new technologies and to new organization design. To establish a better fit between the curricula of business and

engineering schools and special organizational training programs and the requirements of the workplace, educational programs must be based on: 1. new conceptual orientations, 2. the acquisition of organization design skills, and 3. training in action-research types of projects.

Lorange, P. and Roos, J. "Why Some Strategic Alliances Succeed and Others Fail." *Journal of Business Strategy*. Jan/Feb 1991

A key competitive precondition for any organization involved in any of today's multinational businesses is speed and pace in implementing strategies. Although one's organization may offer superior products or services today, it may quickly lag behind its competitors if it is not adept at implementing critical decisions. An important approach to this requirement is the increasing use of strategic alliances. Today's decision maker needs not only to function in a competitive and hostile environment but also to be able to cooperate with other companies, perhaps even with one that, in other respects, may be a competitor.

Magee, J.F. "1992: Moves Americans Must Make." *Harvard Business Review*, vol. 67, no. 3. May-June 1989

US companies must begin preparing for the ramifications of the establishment of a single European Community (EC) market for products, services, finances, and labor by the end of 1992. This unification will have varying effects on different kinds of companies. US firms with broad bases in Europe should learn to exploit the opportunities for improved productivity that lower regulatory barriers will bring. When technical and regulatory barriers are removed in 1992, an American company with a position in only one local European market may: 1. expand through acquisition or merger, 2. form a strategic alliance, 3. rationalize by turning a diversified local company into a focused multinational company, and 4. sell out and withdraw. One of the worries for US companies that export to Europe will be whether or not a unified European community will impose new constraints on importers. US firms that have focused exclusively on their own home markets may suddenly face aggressive competition from European corporations.

Main, J. "The Winning Organization." *Fortune*, vol. 118, no. 7. Sept. 26, 1988

The successful business organization of the 1990s will be less structured and more reliant on technology to keep itself competitive in ever-changing business conditions. Speed in responding to change and competitive pressures will give firms an edge, as will the integration of information and strategies. Lean, flat, decentralized organizations with more strategic alliances will prevail, and there will be global standards for quality, pricing, service, and design. To attract and keep employees, companies will need to offer better benefits and motivation in the form of equity shares, a real voice in decisions, and compensation that is tied to performance of the company. Revised accounting standards will be necessary to determine factors such as quality, deliveries, and output that reveal how a company is really performing.

Meiklejohn, I. "Computing Matters: Making the Euro-Cap Fit." *Management Today*, pp. 117-118. December 1989

The recent announcement by the predatory French giant Cap Gemini Sogeti (CGS) to raise over one billion pounds of funding caused nervous speculation in the UK computer services firms that are possible CGS targets. The European computer services industry, the "soft" end of the information technology business, is undergoing a fundamental restructuring. The advent of the single European market prompts a radical consolidation as the big players prepare to compete internationally. The UK has 3 of the top 10 European-owned service companies, so it is holding its own in that group. But competition looms from another source - the big management consultancy firms, both in Europe and in the US. Systems integration is vital. Firms without the skills must form strategic alliances or merge with companies having them. CSA President Tom McCafferty believes that the UK's leading systems houses are well positioned to take advantage of these emerging key growth areas.

Meyer, P.W. "Non-Linear Learning in Large Technological Firms: Period Four Implies Chaos." *Research Policy*, vol. 19, no. 2. April 1990

For many large firms, advancing technology is causing rapid and often uncharted changes. Responses to these changes reveal more radical, nonlinear forms of organizational learning to be even more significant than previously believed. Types of organization learning in large high-technology firms include: 1. maintenance learning, 2. adaptive learning, 3. transitional learning, and 4. creative learning. A learning framework is proposed that is derived from previous work. This framework is augmented with an intensive case study of one exemplar. Focus is directed to the discontinuous learning abilities needed during 2 learning periods that are especially critical today - crisis and renewal of innovation. By being aware of the issues and changes that are apt to occur in each organizational learning phase, firms are more likely to identify and develop the options needed to effectively plan and manage technological change.

Miles, R.E. "Adapting to Technology and Competition: A New Industrial Relations System for the 21st Century." *California Management Review*, vol. 31, no. 2. Winter 1989

Increasing global competition and rapid technological change are demanding a new organizational form that is lean and flexible and that functions as a network. Firms will need mechanisms to assure a secure, mobile, and well-trainable workforce that can respond to the organizational challenges. Management, workers, and unions will need to develop new mechanisms for dealing with these new structures. In the dynamic network model, instead of a single organization with design, engineering, manufacturing, distribution, and sales under one corporate roof, several organizations will be linked together for production purposes. For managers and workers, there will be an opportunity to use their capabilities far more efficiently than is possible today. They will experience greater job demands and greater job satisfaction. A new "business unionism" will emerge aimed at improving the total work and income security of its membership by enhancing mobility and skill development.

Miller, D. "The Structural and Environmental Correlates of Business Strategy." *Strategic Management Journal*, vol. 8, no. 1. Jan-Feb 1987

An attempt is made to relate some of the most common dimensions of business-level strategy to their organizational contexts. A model is developed that predicts the structural and environmental correlates of a strategy based on the number and uncertainty of its contingencies. Hypotheses are developed and tested on 2 databases: 1. some 161 static profiles of firms at a given point in their history, and 2. the changes that took place over a 5-year interval in a completely different sample of 110 Canadian and Australian firms. It is demonstrated that strategies of complex product innovation, marketing differentiation, market breadth, and conservative cost control each have pronounced but very different relationships with bureaucratic and organic structural devices of uncertainty reduction, differentiation and integration, and environmental dynamism, heterogeneity, and hostility.

Miller, D., Droge, C., and Toulouse, J. "Strategic Process and Content as Mediators Between Organizational Context and Structure." *Academy of Management Journal*, vol. 31, no. 3. Sept. 1988

In order to formulate and test a causal model integrating constructs of chief executive officer (CEO) personality, environment, structure, strategy process, and strategy content, 77 firms with 500 or fewer employees were surveyed by questionnaire. The response rate was 78%. Each firm's CEO completed scales on need for achievement, decision-making style, and innovation, while other executives answered questions concerning environmental uncertainty and structure. The results of LISREL analyses show that CEOs need for achievement affects intended rationality of the strategy-making processes, which in turn, increases structural formalization and integration. In addition, environmental uncertainty was found to influence product innovation, which increased structural formalization and integration and decreased centralization. The relationship between strategic process and content was also found to affect their mediation between context and structure.

Miller, P. and O'Leary, T. "Hierarchies and American Ideals, 1900-1940." *Academy of Management Review*, vol. 14, no. 2. April 1989

The interrelation between large-scale corporate hierarchies in US society and political culture in the first 40 years of the 1900s is explored through a series of linked sets of concepts that depict the corporation and its management as a valued social innovation. The reconciliation of hierarchy with American political culture is analyzed in 3 sections - the progressive years, the 1920s, and the 1930s. During the first 20 years of the 1900s, the idea of concentration in corporate authority was understood as a socially destructive appropriation of initiative from other social groups. During the 1920s, the writings of Follett (1918, 1926) articulated the optimism about managerial practice that pervaded the political rhetoric. In the 1930s, the inability of industrial and political leaders to cope with the Great Depression became a basis for refuting the existing knowledge of administration. These distinctive conceptions of the

nature and basis of managerial authority can be understood by reference to the influence of particular political cultures.

Neilson, G.L. "Restructure for Excellence: The Secret in Downsizing." *Management Review*, vol. 79, no. 2. Feb 1990

Improving organizational effectiveness and reducing overhead costs requires a customized approach consistent with the firm's culture - no single "cookie cutter" approach works for every company. Nevertheless, ineffective organizations- and effective solutions to their problems share some common characteristics.

Nienstedt, P.R. "Effectively Downsizing Management Structures." *Human Resource Planning*, vol. 12, no. 2. 1989

Numerous corporations, including many being merged or acquired, are currently eliminating layers of management employees. The major reason for these reductions may be to reduce costs. A 5-step process is recommended for identifying excess positions: 1. Make an overall assessment of the current structure. 2. Collect whatever data are necessary. 3. Ask the right questions. 4. Determine the optimal organization structure. 5. Determine which specific positions are unnecessary. A wide array of issues pertinent to implementation must be addressed, including redeploying existing managers; reviewing the organization's systems, processes, and procedures; appraising performance; retraining; and melding structures together during a merger. Suggestions to ensure positive results include: 1. not waiting until there is a crisis, 2. acquiring top management support, 3. ensuring that needed systems and processes are in place, 4. installing a follow-up system, and 5. setting improvement goals.

Nowlin, W.A. "Restructuring in Manufacturing: Management, Work, and Labor Relations." *Industrial Management*, vol. 32, no. 6. Nov/Dec 1990

Manufacturers in the US are facing an economic recession and competition in an increasingly global marketplace. Some companies will fail to act in the face of these challenges, while others will make the strategic decision to restructure in preparation for the next decade. This will involve realignment of positions, decentralization, job redesign, and an enhanced relationship with the union and workers. Since the late 1800s, there have been a number of organizational design paradigms that have facilitated internal company restructuring, including: 1. the owner managed paradigm, 2. the functional paradigm, 3. the divisional paradigm, and 4. the matrix paradigm. Today's manufacturers need flexibility to respond to environmental challenges and a new management philosophy that emphasizes shared values at all organizational levels. Today's structures have fewer management layers, broader spans of control, and workers with more autonomy and information.

Oliver, C. "Strategic Responses to Institutional Processes." *Academy of Management Review*, vol. 16, no. 1. Jan. 1991

The convergent insights of institutional and resource dependence perspectives are applied to the prediction of strategic responses to institutional processes. A typology of strategic responses, varying in active organizational resistance from passive conformity to proactive manipulation, is offered. Ten institutional factors are hypothesized to predict the occurrence of the alternative proposed strategies and the degree of organizational conformity or resistance to institutional pressures. The institutional framework can accommodate a variety of strategic responses to the institutional environment when the degree of choice and action that organizations exhibit in response to institutional constraints and expectations is not assumed to be invariant across institutional conditions. This theory provides an appropriate basis of comparison for revealing institutional theory's delimiting assumptions, identifying the full repertoire of alternative strategies available to organizations that confront institutional demands and expectations and determining the factors that predict when organizations will resist or conform to institutional pressures.

Orru, M., Hamilton, G., and Suzuki, M. "Pattern of Inter-Firm Control in Japanese Business." *Organization Studies*, vol. 10, no. 4. 1989

An exchange theory or a structural theory of control is inadequate for explaining non-Western patterns of interfirm relations. A study is conducted that adopts an institutional theory of power to explain the peculiar patterns of horizontal control that obtains in interfirm relations within and among large Japanese business groups. The business group is the basic organizing unit in the Japanese economy. The 2 major patterns of control that characterize interfirm relations are horizontal and vertical control. The pattern of horizontal control through reciprocal shareholding is present not only in the ownership of stocks within groups, but also among groups. The main rationale for constructing a solid vertical structure of subsidiary firms in Japanese business is to guarantee a mutually beneficial, self-sufficient industrial structure to lending firms and to affiliates. Other mechanisms that foster intragroup and intergroup cohesiveness include interlocking directorships, joint enterprises with domestic and foreign groups, and involvement in business associations. The current research on capitalist organizational forms should emphasize not the universal nature of capitalist domination, but rather its diversity.

Pennings, J.M. "Structural Contingency Theory: A Multivariate Test." *Organization Studies*, vol. 8, no. 3. 1987

The methodological underpinnings that surround the research activities of structural contingency theory are discussed. The contingency approach asserts that, for an organization or its subunits to be effective, there must be goodness of fit between its structure and its environment. The 2 research strategies reviewed involve a multivariate examination of the structure-environment-effectiveness relationship. One of these strategies investigates deviations from ideal structural profiles, and the other involves a canonical correlation

analysis between structural and environmental attributes for low and high effectiveness units. To illustrate the 2 analysis strategies, results from field research in a commercial bank with 21 districts are employed. Information is obtained from 108 branch managers, 198 platform people, 1,180 tellers, and 2,354 customers. The results indicate that effective organizational units have strong structure-environment interrelationships and lead to the conclusion that there are effectiveness-induced constraints on the selection of an organization's design or its environment.

Peters, T. "Time-Obsessed Competition." *Management Review*, vol. 79, no. 9. Sept. 1990

Quality and service are important competitive issues, but time management will be the primary battleground in the pursuit of global competitiveness in the 1990s. Companies routinely waste 95% of their time by holding up products and services in their delivery systems. Changes needed to reverse these delays include: 1. Pioneer the application of information technology inside and outside the firm. 2. Revolutionize organizational structures to eliminate barriers among functions. 3. Redesign business processes to reduce the numbers of trivial delays. 4. Make time the principal basis for measurement throughout the company. 5. Give frontline employees the authority to make decisions and encourage them to break the rules. 6. Use information technology to decentralize and empower people at the front line. 7. Share all information with network partners. 8. Restructure people, processes, and technology to focus on a time-centered environment.

Powell, W.W. "Hybrid Organizational Arrangements: New Form or Transitional Development?" *California Management Review*, vol. 30, no. 1. Fall 1987

Due to recent structural changes in the world economy, nonmarket, nonbureaucratic organizational arrangements (hybrids) have become significant among contemporary organizations. Apparently, hybrid organizational forms represent a better fit with new market and technological demands. The rationale for the following kinds of hybrids is described: 1. craft-based producer networks, 2. strategic partnerships in high-technology industries, 3. extended trading groups, and 4. vertically disaggregated large firms. Examples of network forms of organization in craft industries include construction, publishing, and textile industries. Hybrids capture some of the powerful incentives linked with small firms and are better able to access know-how from outside organizational boundaries. Therefore, they enable more rapid and reliable information flow. Hybrids, like most types of social organization, may restrict access where there are enduring patterns of repeat trading. There also is concern, as in any asymmetric relationship, that one partner will receive a disproportionate share of the relationship's value.

Rabstein, G. "Let's Go Back to the Basics of Global Strategy." *Journal of Business Strategy*, vol. 10, no. 5. Sept/Oct 1989

In a recent survey of executives in 3,500 companies throughout the US, respondents were severely critical of US industry's global competitiveness. In less than a decade, the US has

gone from being the world's biggest lender nation to being the world's biggest debtor nation. According to U.S. News and World Report, recent polls indicated that nearly 3/4 of the US public consider the trade deficit a serious national security problem. A lesson can be learned from the Japanese, who first used low labor costs to gain a foothold in worldwide targeted markets. This product advantage was reinforced by strong marketing and distribution initiatives, constant development of new and related products, and an extraordinary global distribution system. Actions that the US might consider include: 1. a new emphasis on strategic thinking and implementation, 2. concentration on producing world-class products and services, 3. sensitivity to cultural characteristics, customs, and other elements that may not be necessary in domestic markets, 4. a realization of the increased importance of segmentation, and 5. the formation of strategic alliances.

Reed, M. "The Problem of Human Agency in Organizational Analysis." *Organization Studies*, no. 9, no. 1. 1988

The problem of human agency has influenced the intellectual development of organizational analysis in various ways. Organizational analysis has been shaped by successive attempts to come to terms with the problem of agency in 4 interrelated aspects: 1. as an intellectual leitmotif directing the trajectory of the historical development of organizational analysis, 2. as an analytical and methodological conundrum focusing theoretical and technical debate, 3. as a moral preoccupation forming a wider ethical debate over the implications of organized action for individual conduct, and 4. as an ideological discourse within which conflicting views can be expressed concerning the sociopolitical relevance of complex organizations. Currently, 3 general trends exist in the evaluation of organizational analysis: 1. fragmentation in the theoretical frameworks, 2. tendency toward epistemological polarization, and 3. a growing recognition of the politicization of organizational analysis.

Roberts, K.H. "Managing High Reliability Organizations." *California Management Review*, vol. 32, no. 4. Summer 1990

Romanelli, E. "Organization Birth and Population Variety: A Community Perspective on Origins." *Research in Organization Behavior*, vol. 11, pp. 211-246. 1989

At the heart of recent inquiries into population and community evolution is a question about the origins of new organizational forms. Fundamentally, the innovation of organizational forms accounts for the variety of organizations we see about us. Recent ecological literature has advanced a number of ideas about conditions that facilitate organizational innovation (e.g., discontinuous changes in technology) and about ways in which new forms are established in communities (e.g., quantum speciation). Almost no work has been done, however, to explore the context and process underpinnings of when and where and what kinds of innovations are actually introduced. This paper develops the idea that organizations and populations in a community filter individuals' access to information about opportunities for innovation and to resources for taking advantage of them. At the core of arguments presented here is an

assumption that individuals' access to information and resources about particular opportunities primarily underlies processes of organizational innovation. Organizations differ in their dominant competences. Populations and communities change over time. As a consequence of these differences and changes, different organizations and different populations will emerge as high-rate producers of organizational births and innovations. Insights into both the origins and kinds of organization innovations that will emerge in a community can thus be gained by examining how organizations and populations structure flows of information and resources over time.

Romanelli, E. "The Evolution of New Organizational Forms." *Annual Review of Sociology*, vol. 17, pp. 79-103. 1991

Rather quietly over the last decade, a large body of literature has emerged to consider how new forms of organizations arise and become established in the organizational community. The literature represents a very wide array of theoretical perspectives, and no emerging consensus or dominant theme can plausibly be identified. No long stream of research has been produced to validate the arguments of any perspective. What we find instead is a disparate group of mostly nascent theories from organizational ecology, economics, institutional sociology, strategic management, and others, all seeking to explicate the nature of contexts and processes that may generate new organizational forms. This review organizes this literature according to assumptions about how variations are generated in the organizational community. Three perspectives appear to capture most of the arguments: an organizational genetics view, which emphasizes random variation; an environmental conditioning view, which considers variation to be contextually constrained; and an emergent social systems view, which considers variations in organizational forms to be the products of embedded social-organizational interactions. Theories associated with each of the perspectives are explicated, and their practical implications for future research are examined. The review concludes with a brief consideration of the theory of the evolution of new organizational forms as itself an evolution of a new and important field of study.

Rosner, M. and Putterman, L. "Factors Behind the Supply and Demand for Less Alienating Work, and Some International Illustrations." *Journal of Economic Studies*, vol. 18, no. 1, 1991.

Jobs that provide intrinsic satisfaction are referred to as less alienating. These jobs are marked by skill intensity and by opportunities for workers to use their own ideas, work in groups, learn new skills, do interesting work, and determine their own pace of work. At a general level, it is contended that workers' demands for less alienating work increase with their level of education and with the material living standards afforded by their earning power. In Sweden, rising education and income levels and a lowered price of less alienating jobs to workers plus the existence of a comprehensive social welfare system have raised the demand for alienation-reducing work innovations. Industry in Japan provides an example of partial innovation in the direction of alienation-reducing work. US industry affords an example of relatively low supply of less alienating jobs, while the kibbutzim in Israel provide an example of relatively rapid adoption of less alienating technologies and work structures in

community-based enterprises in which the employer is the collectivity of worker-members. Rousseau, D.M. "Issues of Level in Organizational Research: Multi-Level and Cross-Level Perspectives." *Research in Organizational Behavior*, vol. 7, pp. 1-37. 1985

Implications of the concept of level for organizational theory and research are presented in this chapter. Issues of level enter into the researcher's choice of the organizational unit of measurement and analysis (e.g. organization, department, work group, or individual). Research and theory combining different units in measurement and/or analysis risk biases of mis-specification and aggregation. To avoid such biases, theory, and research must explicitly address the role of level in organizational phenomena. A typology of models combining different levels in the study of organizations is presented to help organizational scientists avoid measurement and conceptual difficulties in studying mixed-level, organizational processes. The three models, compositional, cross-level, and multi-level, are described with a review of representative organizational studies illustrating each model. Theory explicitly addressing the role of level in its specification of concepts and their interrelations is essential to sound cross-level and multi-level research. This chapter addresses some issues pertinent to the development of cross-level and multi-level theories, including the nature of the hierarchical relations between organizational level. Finally, guidelines for the conduct of cross-level and multi-level research are presented.

Scott, W.R. "The Adolescence of Institutional Theory." *Administrative Science Quarterly*, vol. 32, no. 4. Dec 1987

Institutional theory is in its adolescence. A study reviewed recent empirical studies using institutional arguments and examined the theoretical frameworks and arguments of leading contributors to institutional theory in an effort to compare and contrast organizational analysis theories. The study found much diversity, with a variety of definitions and causal arguments employed by the different contributors and studies. Four sociological formulations, all claiming an institutional focus, involve institutionalization as: 1. a process of instilling value, 2. a process of creating reality, 3. a class of elements, and 4. a distinct societal sphere. The study found 7 different accounts of structural influence, which vary according to: 1. the types of institutional elements that are studied, 2. the identified causal mechanisms, and 3. the affected aspects of organizational structure. State and professional bodies are the 2 primary types of actors shaping institutional environments, and they, in turn are shaped by institutional features.

Shrader, C.B., Lincoln, J.R., and Hoffman, A.N. "The Network Structures of Organizations: Effects of Task Contingencies and Distributional Form." *Human Relations*, vol. 42, no. 1. January 1989

An attempt was made to advance understanding of the forces that condition internal network structures by conducting a survey with 36 private, not-for-profit agencies providing services to troubled youth in a large US midwestern metropolis. From these data, the structural measures of density, connectivity, symmetry, and clustering were computed for each organization.

From theories of organization such as Burns and Stalker's (1961) distinction between mechanistic and organic forms, hypotheses were derived relating these network structural properties to the distribution properties of differentiation, formalization, and centralization, along with the task contingency variables of size, age, technology, and professionalization. A regression analysis lends support to the general argument that organic organization is manifested in networks characterized by high density, connectivity, and multiplexity combined with low hierarchy and clustering.

Shortell, S. and Zajac, E. "Internal Corporate Joint Ventures: Development Processes and Performance Outcomes." *Strategic Management Journal*, vol. 9, no. 6, Nov-Dec 1988

A new hybrid form of administrative innovation, internal corporate joint ventures (ICJV), is examined. ICJVs combine the equity involvement of at least 2 parties typically found in joint ventures with the internal staffing of a semiautonomous unit common in internal corporate ventures. Both process and variance models are constructed to investigate the structuring, development, and performance of ICJV in the health care industry. Extensive qualitative and quantitative data are collected for 53 ICJV projects over a 7-year period from 1976 to 1983. The qualitative design involves 13 in-depth comparative longitudinal case studies. Analysis of these case studies suggests that ICJV development could be seen as an iterative, multistage process including: 1. planning formulation, 2. operational implementation, and 3. evaluation reformulation. The variance model is built and tested using the sample of 53 ICJV units; it is intended to examine the impact of various environmental and organizational factors on ICJV performance.

Shrivastava, P. and Souder, W. "The Strategic Management of Technological Innovations: A Review and a Model." *Journal of Management Studies*, vol. 24, no. 1, Jan. 1987

Successful strategic management of technological innovations requires high degrees of integration at several levels of the organization. Detailed field studies with over 200 new product innovations at 50 US firms were conducted. A model that focuses on the concepts of organizational integration and strategic management of new product innovations was proposed. The model: 1. integrates project organizational and environmental levels of variables, 2. posits contingencies between these variables and 3. empirically derived new product development management methods, and 3. is empirically based. Three phase transfer models have been identified -- stage-dominant, phase-dominant, and task-dominant. To ensure successful innovation, organizations may need to select the innovation process that just fits their conditions. Several propositions for empirical testing are also suggested.

Singh, J.V. and Lumsden, C.J. "Theory and Research in Organizational Ecology." *Annual Review of Sociology*, vol. 16, pp. 161-195. 1990

Major theory and research in organizational ecology are reviewed, with an emphasis on the organization and population levels of analysis and processes of organizational foundings, mortality, and change. The main approach to organizational foundings examines the roles of

density dependence and population dynamics. Six approaches to studying organizational mortality are fitness set theory, liability of newness, density dependence, resource partitioning, liability of smallness, and the effects of founding conditions. Research on organizational change is just beginning to appear in the literature. The convergence between ecological and institutional research is discussed, especially the role of legitimacy in population dynamics, and the effects of institutional variables on vital rates. Some key criticisms of organizational ecology are addressed, and some suggestions for future research are proposed.

Strebel, P. "Organizing for Innovation Over An Industry Cycle." *Strategic Management Journal*, vol. 8, no. 2. Mar-Apr. 1987

It is argued that a gap tends to develop over an industry's life cycle between potential innovators in a company and the dominant company culture. The nature of the gap is explored by contrasting the different types of innovation needed for longer run survival during an industry's evolution, with the disposition of mainstream corporate organization toward innovation. As a result of the growing innovator/company culture gap, successful organization for innovation, it is argued, will require greater decoupling from the organizational mainstream over the industry life cycle. This hypothesis is used to predict which of 4 popular organizations for innovation (widespread team competition, independent task forces, simulated entrepreneurship, and organizational spin-offs) is most suited to each stage of an idealized industry's evolution, based upon its fit with the dominant corporate culture and the type of innovation required. The predicted organization set is discussed in terms of well-known cases and tested using executive survey data.

Sullivan, J.J. and Nonaka, I. "The Application of Organizational Learning Theory to Japanese and American Management." *Journal of International Business Studies*, vol. 17, no. 3. Fall 1986

Karl Weick, in The Social Psychology of Organizing, theorized in effect that organizational learning must be governed by a theory of action. Such a theory can be described in terms of variety amplification by senior managers and variety reduction by junior managers. In a study of senior American and Japanese executives, the Japanese showed a stronger commitment to this theory of action than the Americans did. Implications of strategy-setting behavior in both cultures are discussed.

Teagarden, M.B. and Von Glinow, M.A. "Sino-Foreign Alliance Types and Related Operating Characteristics." *International Studies of Management and Organization*, vol. 20, no 1,2. Spring, Summer 1990

In the Peoples' Republic of China, most transnational corporations engage in some form of strategic business alliance with Chinese enterprises of the government, despite their preference for wholly owned subsidiaries. These Sino-foreign alliances include: 1. equity joint ventures, 2. contractual joint ventures, 3. process or assembly buyback agreements, 4. long-term

licensing agreements, 5. dynamic technology transfer agreements, 6. compensation trade agreements, and 7. exploration and research consortia. These various modes can be categorized into 4 types that have different operational characteristics. Alliances can be differentiated along an obligation dimension and an involvement dimension. The combination of the reciprocal and contractual obligation modes with the operating and passive involvement modes produces the following types of alliances: 1. operating reciprocal, 2. operating contractual, 3. passive contractual, and 4. passive reciprocal.

Tushman, M.L. and Romanelli, E. "Organizational Evolution: A Metamorphosis Model of Convergence and Reorientation." *Research in Organizational Behavior*, vol. 7, pp. 171-222. 1985

This paper develops a theory of organizational evolution which helps reconcile the incremental, transformational and ecological approaches to organization evolution. A punctuated equilibrium model of organization evolution is proposed. Organizations evolve through convergent periods punctuated by reorientations (or recreations) which demark and set bearings for the next convergent period. Convergent periods refer to relatively long time spans of incremental change and adaptation. Convergent periods may or may not be associated with effective performance. Reorientations are relatively short periods of discontinuous change where strategy, power, structure and controls are fundamentally transformed towards a new coalignment. Where middle management interpolates structures and systems during convergent periods, executive leadership mediates between internal and institutional forces for inertia and competitive/technological forces for fundamental change. Hypotheses are developed which focus on the existence and frequency of reorientations, evolutionary patterns which discriminate between alternative fates, and on the role of executive leadership during convergent periods and during reorientations.

Vanderslice, V. "Separating Leadership from Leaders: An Assessment of the Effect of Leader and Follower Roles in Organizations." *Human Relations*, vol. 41, no. 9. Sept. 1988

Instead of being inspired by leaders to do their best, followers may limit themselves to status-appropriate behaviors or resist their low power roles. A case study is presented of Moosewood, a 15-year-old, financially stable, worker-owned and managed restaurant, which has a comprehensive set of internal structures allowing employees to fulfill leadership functions successfully without creating leader roles. Underlying the determination of specific organizational processes and practices are 3 major value considerations: 1. maintaining the basic equality of power and status among members, 2. responding to human needs of members and patrons, and 3. acting in the best interest of the restaurant as a business organization. Comparisons are drawn between Moosewood and W.L. Gore and Associates, a large, complex organization built around a task force system. The organizations share the philosophy that people will do a better job if they like what they are doing. Neither structures jobs involving monitoring another worker's behavior, and each organization is a private enterprise, structured without leaders from early in its life.

Vetinsky, I., Tse, D.K., Wehrung, D.A., and Lee, K. "Organizational Design and Management Norms: A Comparative Study of Managers' Perceptions in the People's Republic of China, Hong Kong, and Canada." *Journal of Management*, vol. 16, no. 4. Dec 1990

The issue of whether norms for organizational design and management are subject to a process of globalization was examined by surveying 155 executives from the People's Republic of China, Hong Kong, and Canada. The survey consisted of structured questionnaires using 2 different sets of Likert-like importance rating scales, one examining organizational design norms and the other focusing on the desired attributes of a good managers. The balance of the evidence supported the hypothesis of globalization. However, the results also indicated that some norms of organizational design that reflect basic cultural values are resistant to change and convergence. Further, it was shown that regulatory and political differences may be reflected in local adaptation of organizational and management design norms.

Victor, B. "Coordinating Work in Complex Organizations." *Journal of Organizational Behavior*, vol. 11, no. 3, May 1990

Differentiation, interdependence, and interest conflict among work units are examined as determinants of managerial selection of coordination strategies. A total of 104 masters of business administration (MBA) students with managerial experience took part in a simulation. The participants were required to choose a strategy to manage systematically different relations among work units. The results reveal a 3-way interaction among differentiation, interdependence, and interest conflict that affects the degree of cooperation and centralization of selected strategies. The formalization of such strategies was affected by an interaction between differentiation and interest conflict. The findings' apparent conflict with former research on the effects on interdependence may be a result of the explicit control of conflict sources in the current study. The study offers only partial support for the proposition that managers may prefer more organic strategies as the amount of differentiation increases.

Weick, K.E. "Fatigue of the Spirit in Organizational Theory and Organization Development: Reconnaissance Man as Remedy." *Journal of Applied Behavioral Science*, vol. 26, no. 3. 1990

The charge that the OD Division of the Academy of Management is a group from which "the zest is gone" is explored in an address to this division. Several images are presented regarding ways of observing and learning. OD professionals are advised to perform reconnaissance, which is defined as lowering one's defenses, seeing fully, looking again at things one considers already understood, capturing previously undetected nuances, and developing high-variety languages to describe what is discovered. Reconnaissance should also be applied to the values, beliefs, and practices of OD to determine their validity. OD practitioners are encouraged to study and disseminate the findings of theorists, to act incrementally at times, and to identify problems and issues that are not appropriately addressed by those working in OD.

Whetten, D.A. "Organizational Growth and Decline Processes." *Annual Review of Sociology*, vol. 13, pp. 335-58. 1987

Literature on the application of the life cycles analogy to the study of organizations is reviewed. The controversy over the use of life cycle stages to characterize the evolution of organizations is discussed. Research on the causes and consequences of organizational growth and decline, as well as the effective management of growth and decline processes, is examined in detail. Issues endemic to research on evolutionary processes are discussed, including the definition and operationalization of organizational growth and decline.

Williams, L.J. and Podsakoff, P.M. "Longitudinal Field Methods for Studying Reciprocal Relationships in Organizational Behavior Research: Toward Improved Causal Analysis." *Research in Organizational Behavior*, vol. 11, pp. 247-291.

This chapter examines major issues concerning the use of longitudinal field methods to assess the nature of reciprocal relationships in organizational behavior research. To begin, an introduction to the analysis of reciprocal relationships in the field of organizational behavior is provided, and the longitudinal panel studies in this area are reviewed, with a specific focus on methodological issues. Four data analytic techniques that have been used (cross-lagged and dynamic correlation analyses, the frequency-of-change-in-product-moment technique, and path analysis) are critically evaluated, as is their use in identifying the influence of moderator variables. Also discussed are the problems of unmeasured variables and identifying the appropriate time lag. Then, a promising alternative is presented, in the form of latent variable structural equation modeling, and a reanalysis of one of the reviewed studies is conducted to demonstrate the use of this approach for assessing the extent of mutual influence between organizational behavior variables. We also discuss how latent variable models can be used to analyze data from more than two waves, empirically identify appropriate time lags, test for the effects of moderators, and incorporate multiple indicators. This article concludes with several general concerns that should be considered in future longitudinal studies in organizational behavior.

Zucker, L.G. "Institutional Theories of Organization." *Annual Review of Sociology*, vol. 13, pp. 443-464. 1987

Institutional theories of organizations provide a rich, complex view of organizations. In these theories, organizations are influenced by normative pressures, sometimes arising from external sources such as the state, other times arising from within the organization itself. Under some conditions, these pressures lead the organization to be guided by legitimated elements, from standard operating procedures to professional certification and state requirement, which often have the effect of directing attention away from task performance. Adoption of these legitimated elements, leading to isomorphism with the institutional environment, increases the probability of survival. Institutional theories of organization have spread rapidly, a testimony to the power of the imaginative ideas developed in theoretical and empirical work. As rigor

increases, with better specification of indicators and models, it is likely to attract the attention of an even larger number of organizational researchers.

Institutional theory is inherently difficult to explicate, because it taps taken-for-granted assumptions at the core of social action. The main goal of this review, then, is to make institutional theory more accessible. The review begins with a brief summary of the two current theoretical approaches to institutionalization in organizations, moves to identification of indicators of central concepts, and then progresses to a review of empirical research. It concludes with two short sections, one on points of intersection with other theories of organization, the other on the "new institutionalism" in economics and political science.

Zucker, L.G. "Normal Change or Risky Business: Institutional Effects on the 'Hazard' of Change in Hospital Organizations, 1959-1979." *Journal of Management Studies*, vol. 24, no. 6. Nov. 1987

Using an institutional approach, 3 aspects of the change process in institutions are investigated: 1. control by the institutional environment of organizational change, 2. normal change versus risky innovation processes, and 3. the impact of change on organizational performance and survival. Change processes need to be explored in a setting where clearly differentiated organizational types coexist. Data from California for 1959-1979 are collected from a variety of sources for the 3 types of general surgical hospitals: 1. county, 2. private-nonprofit, and 3. private-for-profit. The main analyses consist of hazard function estimates for hospitals, starting with effects of change from the institutional environment and followed by considering effects of innovation under organizational control. Medi-Cal and the effects of reform legislation are mostly positive but differ significantly by hospital type. Adoption of normal institutionalized innovation consistently lowers the hazard of closure across types. While some evidence of linkage between performance and survival is present, it varies by type of hospital.

Zuckerman, H.S., Kaluzny, A.D., Montgomery, R.L., Ford, L., and Trout, M. "Strategic Alliances in Health Care: The Challenges of Cooperation; Commentaries; Reply." *Frontiers of Health Services Management*, vol. 7, no. 3. Spring 1991

Zumamoto, R.F. and Cameron, K.S. "Environmental Decline and Organizational Response." *Research in Organizational Behavior*, vol. 7, pp. 223-262. 1985

The literature on organizational decline from different fields presents a diversity of often contradictory prescriptions for management. A model employing a population perspective is developed that examines various types of changes that can occur in the environment of populations of organizations and result in four different conditions of decline: erosion, contraction, dissolution, and collapse. The model is used to explain: (1) why different populations of organizations experience different conditions of decline and how each of the conditions of decline differentially effects competition and the subsequent incidence of success and failure within a population; (2) why organizations within a population variably experience

the condition of decline common to the population as a whole and how this will affect the diversity of tactics and strategies employed by individual organizations in response to decline; and (3) why the literature in different areas advocates the use of apparently conflicting prescriptions for the management of decline.